DOCUMENT RESUME

ED 141 638 95 CE 011 985

AUTHOR McKinlay, Bruce
TITLE Characteristics of Jobs That Are Considered Common: Review of Literature and Research. Information Series No. 102.
INSTITUTION Ohio State Univ., Columbus. Center for Vocational Education.
SPONS AGENCY National Inst. of Education (DHEW), Washington, D.C.
PUB DATE Oct 76
CONTRACT NE-C-00-3-0078
NOTE 63p.
AVAILABLE FROM Ohio State University, Center for Vocational Education, 1960 Kenney Road, Columbus, Ohio 43210 ($3.80)

EDRS PRICE MF-$0.83 HC-$3.50 Plus Postage.
DESCRIPTORS Career Change; Career Education; *Classification; Cluster Grouping; Curriculum Planning; *Individual Characteristics; *Job Analysis; Literature Reviews; *Occupational Clusters; *Occupational Mobility; Research Projects; *Socioeconomic Status; Vocational Development; Work Environment

ABSTRACT

This paper represents one component of a multifaceted research and development effort aimed at identifying the types of personal and job characteristics common to and transferable from one work situation to another to determine what schools should be teaching to all students to improve their chances of adapting to new jobs. This particular study contains a review and synthesis of the major types of occupational classification schemes and their implications for occupational transfers. After a section outlining the focus of the paper, the major types of occupational analysis are discussed: Job analysis, analysis of worker traits, and ranking of jobs by socioeconomic status. The author describes the distinguishing features pointing out the strengths and weaknesses and citing literature related to each system. The relevance of the systems to career education curriculum is also discussed. Another section deals with the contribution career development theory makes to an understanding of individual decisions to change occupations. One section states that curriculum areas are not appropriate to use as an occupational classification system. Two sections relate the work environment and labor market demand to occupational transfer. A summary of the major classification approaches follows with several suggestions for a general purpose system and a discussion of the implications of the research for educational planning. Ten of the 61 pages are devoted to a bibliography, and a list of other planned reports on the project is appended. (LMS)

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ED141638

Information Series No. 102

CHARACTERISTICS OF JOBS THAT ARE CONSIDERED COMMON:

Review of Literature and Research

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U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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The Ohio State University
1960 Kenny Road
Columbus, Ohio

October 1976

CE 011 985

An Interim Report
On a Project Conducted Under
Contract No. NE-C-00-3-0078

The material in this publication was prepared pursuant to a contract with the National Institute of Education, U.S. Department of Health, Education, and Welfare. Contractors undertaking such projects under government sponsorship are encouraged to freely express their judgment in professional and technical matters. Points of view or opinions do not, therefore, necessarily represent official National Institute of Education position or policy.

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THE CENTER MISSION STATEMENT

The Center for Vocational Education's mission is to increase the ability of diverse agencies, institutions, and organizations to solve educational problems relating to individual career planning, preparation, and progression. The Center fulfills its mission by:

- Generating knowledge through research
- Developing educational programs and products
- Evaluating individual program needs and outcomes
- Installing educational programs and products
- Operating information systems and services
- Conducting leadership development and training programs

FOREWORD

Because many people change jobs, and some do so frequently, future education and work programs have to be concerned with and improve the ability of individuals to make career changes. Under sponsorship by the National Institute of Education, The Center is conducting research and development on questions of what schools should be teaching to all students to improve their chances of adapting to new jobs when a job change is desirable or necessary.

One interim product of this effort is this review of literature and research on the characteristics of jobs that are considered common. This summary and discussion serves as one component of a multifaceted R&D effort aimed at identifying the types of personal and job characteristics that previous research has identified as common and potentially transferable from one work situation to another. The review is intended to form the basis for a synthesis of what is presently known about the characteristics of jobs such that it would be possible to describe the elements of commonality involved when a person makes a career change, even though the jobs may range across apparently diverse occupational groupings. The literature contains numerous schemes for classifying or clustering jobs, presumably to relate occupations on some common basis. The key issue of this paper was to explore how various approaches to job classification may contribute to a better understanding of occupational adaptability and skill transfer.

Published separately, but augmenting this review of job classification schemes are two other review papers. Though prepared independently, the three papers relate to the common concern for identifying the factors which can facilitate occupational adaptability. One is a review of what is known about the range of occupation-related skills and characteristics that could be considered transferable from one occupation to another. It focuses on describing those transferable skills which are teachable in secondary and post-secondary career preparation programs. The other is a review of what is known about the transferability of occupational skills focusing on the process or the facilities of skill transfer. These and other planned project reports are listed inside the back cover or this report.

The Center expresses its deep appreciation to Dr. McKinlay for his scholarship in the preparation of the report. Recognition is also due Dr. Ann Miller, University of Pennsylvania; Dr. James Scoville, University of Illinois; Dr. J. W. Cunningham, North Carolina State University; and Dr. Ernest McCormick, Purdue University for their critical review of the manuscript prior to final revision and publication. Special gratitude and appreciation is extended to the project's Panel of Consultants: Dr. Marcia Freedman, Conservation of Human Resources; Dr. Jerome Moss, University of Minnesota; Dr. Calvin Taylor, University of Utah; and Mr. Robert Stump, National Institute of Education for thier help and contributions to the project and throughout the development of this report.

The report was prepared under the general oversight of Dr. Frank C. Pratzner, Director of The Center's study of occupationally transferable skills.

Dr. Robert E. Taylor
Director
The Center for Vocational Education

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FOCUS OF THE PAPER

The importance of work has made it a subject of inquiry of virtually every social and behavioral science discipline. Each has identified one facet or another of the subject and has developed an analytical tradition for examining and interpreting work. While occupational transfers *per se* have only occasionally been the primary focus, much of this research does bear upon an understanding of what is common about occupations.

Certainly the most painstaking and detailed of this research have been the job activities and worker trait analyses, but no attempt to describe what is common about occupations and no explanation of occupational transfers can be limited to that subject matter. Much of what we know to be important about work is the context within which it occurs. Some of the most extensive research, around which most occupational classification systems in current use are built, deals with an ascribed rather than an inherent characteristic of occupations, namely socio-economic status. Likewise no understanding of occupations in general or occupational transfers in particular is complete without some understanding of the way in which people go about making both their initial and subsequent decisions about occupations, so the career development literature also proves to be highly pertinent. Because job entry requires not only choice but also preparation, and because skill is an obvious component of both career entry and occupational transfers, the attempts of educators to analyze clusters of occupations relating to curricular areas become important.

There are additional contextual analyses that are virtually indispensable to understanding the patterns of occupational transfer. The work environment, both physical and social, is clearly one of these, with the relative level and structure of labor market demand for various types of work being another essential element in our understanding of occupational transfers. Finally there are some attempts to construct occupational classification systems which either synthesize many of these considerations or attempt to identify a single, multipurpose basis for occupational classification. Thus it is apparent that while some concrete things about occupations are known, there is much about the broader psychological, sociological, and economic context within which work is done that is essential to understanding occupational transfers and how to prepare for them.

This paper will therefore review each of the above analytical traditions and try to identify or infer what it contributes to an understanding of occupational similarities and occupational transfers. Not everyone's research fits neatly into one of these traditions, as John Holland's contribution to both worker trait analysis and career development clearly illustrates. Such a situation is of little consequence, however, for the purpose is not to classify occupational research so much as it is to raise distinct issues and identify analytical traditions, wherever they appear.

It is apparent that there are two issues to the discussion of occupational classification, the level of detail and the classifying principle. These problems exist even in defining an occupation, for even at their most detailed level, all classification schemes already embody some grouping. For all practical purposes, it is safe to say that jobs are always grouped into occupations on the basis of job duties. With the exception of the *Dictionary of Occupational Titles* (DOT) which is more detailed, there is a rough consensus on the level of detail appropriate for defining occupations, though there is no articulated criterion for this determination.

Beyond the definition of occupations are the issues of the second problem, the appropriate classifying variable and the level of detail that aggregate occupations into useful groupings. An analysis of the several uses of occupational data shows that at least three levels of detail are useful. The focus of this paper is the other question, namely the most useful classifying principle. While some of the classifying variables have been used at broader levels than others and some are harder to aggregate (or disaggregate) than others, the important issue here is the classifying principle.

For the purposes of this paper, there seem to be three essential questions: (a) What does each of these analytical traditions identify as common elements of jobs and how do they classify them? (b) To what extent do those elements contribute to occupational transfers? and (c) What are their implications for education and training programs that intend to enhance the occupational mobility of their graduates? All three steps are essential to a rigorous analysis. It would be easy to overestimate the value of a classification system that nicely isolated a set of skills which could be taught in schools or training programs, if one forgot to examine whether workers actually do transfer between occupations which have those skills in common. A career education program which teaches students skills that will only theoretically enhance their ability to transfer between occupations, and does not know what elements account for actual patterns of mobility will be making a serious error. Thus, in order to isolate skills which not only can be taught, but skills which will actually facilitate occupational transfers, one must examine how effectively the various classification systems predict occupational mobility.

Our current knowledge of transfers is too rudimentary to permit definitive answers to that key question, however. This paper will therefore review what are recognized as common elements of occupations; it will discuss what is known or what can be hypothesized about their influence on transfers, and it will draw some inferences for education.

Cautions

Our general knowledge of the labor market shows occupational transfers to be both substantial and pervasive. The five million people who change occupations in a year (Byrne, 1975) exceed several-fold virtually every other source of labor supply including the one and one-half to two million graduates of higher education institutions (U.S. Department of Health, Education, and Welfare, 1974, 1975; Wirtz & Goldstein, 1975). The propensity of workers to change occupations seems to be relatively stable over time, though actual mobility rates are, of course, affected by cyclical swings in job opportunities (Byrne, 1975). Occupational transfers are most common among young and single workers, with annual transfer rates exceeding 20% for people under 25, but the phenomenon is pervasive throughout all labor force groups (Jaffe & Carleton, 1954).

Any attempt to discuss occupational transfers quantitatively is hampered by the lack of consensus on what grouping of jobs constitutes an occupation. The number of job changes that get counted as occupational transfers will be vastly different if you visualize 200 categories of occupations or 22,000. The above data are based on an analysis using 441 categories.

The level of detail has more than statistical effects, however. Quite different phenomena can be analyzed with five groups than with 22,000, and each has its own utility. Various levels of detail are especially helpful in education where relatively broad groups facilitate choices among curricular programs, while rather specific detail is required for designing the content of specific instructional units.

The study of transfers has other problems as well. Direct measurement of transfers is extremely difficult because the direct measure of occupational transfers requires longitudinal cohort analyses, which are both expensive and time consuming. Also, there is the possibility that patterns of occupational transfers differ from one area to another (McKinlay & Johnson, 1969).

At present we have only crude definitions and quantitative measures of occupational transfers, and we have barely begun to analyze their significant determinants. Throughout much of this analysis we will be limited to theoretical responses to the question of a particular characteristic's actual influence on transfers.

Aside from these methodological difficulties and classification problems, there are intriguing policy questions regarding the optimum level of occupational transfers. The American labor force is generally regarded positively for its adaptability to new production techniques and changes in the markets for goods and services. At the same time employers bemoan turnover.

From the individual's point of view the optimum is not much clearer. The "right" amount of occupational transferring is the amount that produces career success (however the individual may choose to define success), and provides recourse in the face of changes in the demand or working conditions for a particular occupation. From both perspectives, it is apparent that the optimum level of occupational transfers is positive but that more is not always better. Neither the economic, personnel management, or career development literature is at all explicit where that optimum level lies.

At the same time an inquiry into occupational transfers should not assume that all other aspects of a job change are trivial. Changes in employer or location may be equally significant. It is also well to recognize that transfers into and out of the labor force may be important for individuals though not meeting our labor market definition of transfers. For the individual, options for transfer may include non-paid housekeeping, child care, and volunteer work, as well as paid occupations.

The breadth of the topic discussed in this paper has necessitated a depth of analysis which is less than ideal. A review of the various areas of a seemingly endless field of inquiry is a primary, and not insignificant goal of this paper. But any of the topics could, and many should, be examined in more detail. There are some important lines of analysis which recur throughout the paper and seem to tie the disparate approaches to occupational research together with some meaning for occupational transfers and education. One idea is that no career education program is going to maximize a person's career flexibility unless it teaches skills which actually and not just theoretically are transferable between occupations. This proposition highlights the importance of occupational mobility studies and how effectively the various occupational classification systems explain occupational mobility. The second idea is that many classification schemes, by focusing on a single dimension of work, are insufficient for understanding transfers or planning education. Work has many components and interacts with too many other aspects of life so that isolating certain of those components can present a distorted image of what influences occupational transfers. A third recurring theme is that there is a great deal besides vocational skills that is necessary to learn and is appropriate for education. Social and decision-making skills may be more adaptive than technical skills for transfers.

At this stage we must be fairly modest in our discussion of occupational transfers. As important as they are to the functioning of the labor market and the careers of individuals, the subject has received only incidental treatment in most research. Only recently have data become available to permit a really serious quantitative analysis. This lack of empirical literature, together with the fact that occupational classifications are themselves more conceptual and judgmental in their design and execution than they are empirically derived, poses obvious limitations for this paper. The paper is therefore best seen as a review and synthesis of the major types of occupational analysis and their implications for occupational transfers rather than a definitive statement of what has been proven to be true.

Thus we are left with a situation common in American education, where we are expected to produce an effective and efficient response to an ill-defined problem. We can construct a number of plausible bases for education that are relevant to occupational transfers, but we cannot satisfy ourselves that we are right, for we do not know which are the important elements in occupational transfers, let alone how they may be taught. A predilection to concentrate on occupational skills may very well place the focus on matters of marginal consequence. Our understanding of occupational transfers is too general and learning can occur in too many areas and by too many means to make defensible curricular conclusions possible.

JOB ANALYSIS

Probably the most straightforward approach to defining work is to isolate those components which are inherent to a particular job. Several researchers have attempted to look at a job as the sum of a number of tasks or actions which the worker performs as he or she carries out the function of the job. Each job analysis system looks at a somewhat different variable of work, but all try to identify units or building blocks of work and form a complete definition of a job by adding its various units together. Jobs which have several units in common presumably fall into job clusters or families.

The job analysis approach obviously begins with a concentration on qualities of jobs which are very tangible and thus can be quantitatively measured, though physical components are much easier to measure than social or intellectual aspects. Beyond the substantial measurement problem, this approach assumes that through thorough analysis of a job's actual work activities the real essence of the job can be discovered. External factors such as supply of labor and worker career development process are not included. This focus on content to the practical exclusion of context defines the limits of job analysis' relevance to the understanding of occupational mobility.

The impetus for extensive job analysis has come largely from industrial psychology, and it is here where its benefits are perhaps most obvious. As a tool for defining occupations with highly complex technological dimensions (e.g., astronaut, pilot, computer programmer), job analysis is fairly exhaustive. The applicability of job analysis to occupations which are focused less on technology (such as administrative positions where the responsibilities of the job may be more important) is more questionable.

The description of tasks can be done either by using job-oriented or worker-oriented language. An illustration of this apparent dichotomy follows:

> On the one hand, work activities can be described in terms of the technological processes or operations that are carried out. Thus, one could describe job activities in terms of painting, recording, galvanizing, baking or cleaning--describing what end result is accomplished by the work. These we might refer to as job-oriented variables. On the other hand, one could categorize work activities in terms of specific human behaviors--such as making visual discrimination, making decisions, moving objects by hand, or verbal communications. These we might refer to as worker-oriented variables (McCormick, Cunningham, & Gordon, 1967, p. 418).

It appears that a job-oriented analysis is more limited in its application than is the worker-oriented approach. Job-oriented analysis seems more applicable to jobs with a known commonality, such as within a particular organization or technological area. Worker-oriented descriptions center on human behaviors and can define job relationships which do not have *prima facie* connection with others.

While the theoretical bases may be distinct for the job-oriented and worker-oriented systems, the actual clusters of jobs which eventually emerge from the two systems may prove to be quite similar. As yet there is no comprehensive classification system based on worker-oriented task descriptions, so a thorough comparison cannot be made. One suspects that the two types of job analysis may turn out to be two sides of the same coin. They are after all both describing the task elements of a job. Certainly both systems will identify certain job families or clusters. The dichotomy may be more theoretical than actual.

Regardless of the type of analysis, this method offers substantial benefits. Because job analysis identifies worker requirements pertinent to certain groups of jobs, career education courses could be structured to teach students the abilities which are relevant to their career interests. Employers could use the information to facilitate manpower transfer and retraining processes. Finally, the information could be used to establish pay scales based on groups of people performing similar tasks.

The best example of a worker-oriented classification system is found in the third edition of the DOT. A system of functional job analysis was developed by Sidney A. Fine and built around the concept that jobs could be described by their level of involvement with Data, People, and Things--DPT (Fine, Holt & Hutchinson, 1974). Fine describes his system of task (i.e., job) analysis:

> A task is an action or action sequence grouped through time designed to contribute a specified end result to the accomplishment of an objective for which functional levels and orientation can be reliably assigned. The task or action sequence may be primarily physical, such as operating an electric typewriter; or primarily mental, such as analyzing data; and/or primarily interpersonal, such as counsulting with another person (Fine & Wiley, 1971, p. 10).

All jobs in the Data, People, Things arrangement are rated by their degree of involvement with those three denominators. Within each of the categories, "level of involvement" is determined by analyzing the job in terms of a hierarchical structure of verbs. The Data verb structure illustrates: 0—Synthesizing, 1—Coordinating, 2—Analyzing, 3—Compiling, 4—Computing, 5—Copying, and 6—Comparing (U.S. Department of Labor, 1972). Each job is assigned a number according to its 'level' of dealing with Data. Similar structures exist for the People and Things categories, producing a three-digit code.

Several questions about this DPT arrangement can be raised. It is difficult to apply these three categories consistently to the full range of activities found in different jobs, and the small number of verbs chosen for each of the three categories misses some pertinent detail for any particular job. In this connection it is troublesome that the hierarchical structure is not strictly consistent and in places seems to describe different types rather than levels of involvement.

Despite the potential problems with Fine's DPT system, there does seem to be substantial merit to the concept. While the Data, People, and Things categories may not be totally inclusive of all job task activities, they are descriptions of a sizable majority of those tasks, and address social and intellectual as well as physical domains. That breadth is important, both for understanding mobility and planning education. The system provides a straightforward classifying principle and there is substantial latitude to improve the system.

Ernest S. Primoff of the U.S. Civil Service Commission has contributed to the methodology of job analysis. Primoff is known for his formulation of the J-coefficient, which is a "method of rapidly analyzing jobs in terms of patterns of elements, and of analyzing tests by the same elements" (Primoff,

1957, p. 34). The job elements include such abilities as working rapidly, doing arithmetic computations, attention to detail, and reasoning ability. Once job elements have been matched to test elements it is presumed that employees can be administered certain tests to determine their suitability for a particular job.

Primoff's procedure was straightforward. He had analysts rate jobs according to the importance of certain job elements to the job. A particular strength of his approach is that he did not analyze jobs in terms of individual isolated elements but rather similar element patterns. This approach correctly reasons that the total picture of a job is more than the sum of its component parts. Primoff (1959) uses job ratings by work supervisors to determine the importance of job elements to a particular job. This approach, like any rating scheme, can be criticized. If supervisors are too far removed from the actual work their ratings may not reflect directly the actual worker behaviors, but that methodological problem should not obscure the value of treating occupations' requirement patterns.

Extensive job analysis in the U.S. Air Force has been reported by Morsh (1967) and Christal & Madden (1961). Morsh and his associates used questionnaires, observations, and interviews with incumbents of Air Force jobs to formulate descriptions of jobs comprised of a series of specific task statements. An expressed goal of the project was to design training programs for Air Force personnel. Consequently, the Air Force work has questionable relevance to civilian occupational skill development. The limitations of viewing work as merely a group of task statements are perhaps less disadvantageous in a restricted employment circumstance than in the general economy since there is a greater likelihood that a person will be taught the skills of one particular job and not as likely to need to move frequently between occupations. This research ignores such worker-oriented variables as job selection and performance, so its value is greater for the Air Force than for its general contribution to understanding the occupational structure of the U.S. economy (Prien & Ronan, 1971). (It would be interesting and perhaps fruitful to examine the personnel classification systems of other establishments. Certainly those groupings influence transfers within the firms, as is seen in the later discussion of work environment. However, analytical studies of personnel structures are not generally accessible for a review of this sort.

The work of both Ernest J. McCormick and Edwin A. Fleishman represents job analysis based on worker-oriented variables. McCormick and his associates have attempted to discover an underlying behavioral structure to work by identifying those behaviors which are common to certain groups of jobs. By use of a *Position Analysis Questionnaire* (PAQ), McCormick and his associates have identified 178 basic job elements. They subsequently obtained psychologists' ratings of aptitudinal attribute (e.g., short-term memory) and situational attribute (i.e., adaptability to a specified situation such as influencing people) requirements of those job elements (McCormick & DeNisi, 1976). When job elements are described in behavioral terms, inferences can apparently be drawn about attribute requirements of particular occupations. Such information can prove meaningful to people's career plans since they will know the human attributes and other requirements demanded by occupations they wish to pursue. Moreover, those job elements and attributes with substantial skill components become subject matter for occupational education.

Although McCormick's research has been extensive, he and his associates have not as yet developed a classification system based on the underlying structure of work behaviors which they have isolated. There is, however, some promise that such a system could be developed. Only when this is accomplished will the essential question of how effectively worker-oriented job units describe occupational mobility be answered. This empirical test is of special importance to McCormick's system which is based, in part, on the assumption that "one can in fact reconstitute jobs in their entirety from the specific building blocks used in the analysis of the jobs" (McCormick, Jeannert, &

Mecham, 1972, p. 348). If this is the case, one would suspect that the system would be highly predictive of actual occupational mobility patterns. However, Prien and Ronan (1971) have argued that the higher level positions of work involve complex and intangible behaviors, which any analytic structure such as McCormick's would have trouble measuring.

In one sense McCormick's analysis lends itself to career guidance. If behavioral descriptions can be used to identify ability levels, students can match their abilities with job requirements. On the other hand, as we shall see in the next section, it may be that aptitudes are not the most important components of work. If this is the case, career guidance based primarily on aptitude requirements may exaggerate that aspect of career selection. There is a danger in relying heavily on the assumption that there is a certain aptitude level for each job and that either McCormick's ratings or the more exacting test validations have delineated that critical requirement. Evidence which indicates a wide variance in test scores by members in a given occupation suggests that aptitude requirements may be quite flexible and hence not a very efficient predictor of occupational choice or success (Berg, 1971).

Following McCormick, J.W. Cunningham and his colleagues at North Carolina State University have used the *Occupational Analysis Inventory* (OAI), an instrument which defines 622 "work elements" to rate components of jobs, and related them to 103 human attributes, including general vocational skills; cognitive, psychomotor, and sensory capabilities; work interests; and needs satisfied in work settings (Pass & Cunningham, 1975). It is particularly promising that Cunningham's "work elements" extend McCormick's aptitude and situational attributes to encompass a fairly broad spectrum of the variables that are generally considered to comprise work. His work elements are divided into five categories: information received, mental activities, work behavior, work goals, and work context (Cunningham, Tuttle, Floyd, & Bates, 1971). The five areas include worker-oriented as well as job-oriented variables.

In an attempt to derive occupational clusters, Cunningham applied a statistical, hierarchical cluster analysis procedure to various of the *Occupational Analysis Inventory* data for 1,414 occupations. With a substantial inspection and judgmental selection, Cunningham classified his 1,414 jobs into 21 clusters, which contained 88 "micro clusters" (Pass & Cunningham, 1976). The clusters include the following:

1. Organizational and Human Relations
2. Clerical
3. Sales/Customer Service
4. Protective Service
5. Materials/Product Handling, Inspecting, and Recording
6. Applied Physical Science and Technology
7. Electronic/Electrical Equipment/Systems Operation
8. Farming, Forestry, and Botanically Related Occupations
9. Health-Related Occupations
10. Personal Service
11. Performing Arts
12. Visual Aesthetics
13. Animal Care
14. Assembly/Fabrication
15. Structural Work
16. Mechanics and Machine/Equipment Repairers and Operators
17. Machine/Equipment Tending, Feeding, and Offbearing
18. Routine Object/Material Handling and Cleaning

19. Mechanized Equipment and Vehicle Operation
20. Electricians and Electronic Technicians
21. Food Processing/Preparation

These largely empirically derived clusters correspond in many instances with other clustering schemes based directly on job analyst judgment, reinforcing the scope of Cunningham's work elements. While this is perhaps the most quantitative experiment with clustering to date, Cunningham monitored the statistical operation to conform to criteria of reasonableness, so the initial occupational rating, while detailed, was itself judgmental to a degree.

This result improves upon but does not fully transcent our common perceptions of what constitutes reasonable clusters. As with all other systems, one important way to test the validity of Cunningham's approach will be to test how well it predicts actual labor mobility patterns.

Cunningham (1971) has also taken the step of trying to apply his results to the field of occupational education. By using procedures developed earlier by McCormick, Cunningham matched OAI work elements to 103 human attributes in the cognitive, psychomotor, and affective domains. The process made it possible for the OAI to "provide estimates of a job's requirements for the aforementioned human attributes, as well as a description of activities and conditions (in terms of work elements and dimensions) involved in the job (Pass & Cunningham, 1976, p. 3). Because Cunningham is linking a fairly wide range of work elements to human attributes, it would appear that his work is making important strides toward broadening job analaysis to more fully describe work as well as making it specific enough to translate into teachable skills.

Edwin A. Fleishman and his associates have broken work down into smaller components than either Fine or McCormick. Whereas the latter two authors have attempted to designate certain basic activities which comprise a job, Fleishman maintains that it is possible to explain successful performance on these activities in terms of a relatively small number of underlying basic abilities. For instance, a worker may perfect many skills on a job, but the mastery of these skills may relate to a very few basic abilities. In the physical domain Fleishman identifies 10 psychomotor factors (control precision, multilimb coordination, response orientation, reaction time, speed of arm movement, rate of control, manual dexterity, arm-hand steadiness, wrist-finger speed, and aiming) and nine physical proficiency factors (extent flexibility, dynamic flexibility, static strength, dynamic strength, explosive strength, trunk strength, gross body coordination, gross body equilibrium, and stamina). Fleishman hopes to isolate those abilities which account for a wide range of task skills. This knowledge could then be used to enhance workers' career flexibility by allowing them to perfect those abilities which relate to large numbers of skills.

Fleishman's approach parallels some of the worker trait research described later, and there seems to be some validity to his claim that there is an underlying group of abilities which explain human task performances (Fleishman, 1967; Levine, 1973). If this is true then it should be possible to "specify the tasks which should provide the best measure of each of the abilities identified" so that generalization across tasks can be made (Fleishman, 1967, p. 1-9). By identifying certain skills which are efficient predictors of underlying abilities, a behavioral taxonomy for jobs can be constructed based on abilities requirements.

Fleishman's research has not yet demonstrated that this form of job analysis can adequately describe the full range of jobs in the economy. It appears that it applies to those occupations he has tested, but these are relatively small in number compared to the entire economy. Another important and unanswered question is just how much of any given job can be described by the 19 abilities he isolates (Prien & Ronan, 1971). This again raises the problem of basing a classification system on only one variable.

The biggest advantage of job analysis and potential classification systems based on that approach is its careful, focused analysis. No other treatment of work approaches its rigor. Its limitation is that it focuses so exclusively on the job itself, with minimal attention to the worker and work context. The theory that one can describe an occupation by breaking it down into its smallest measurable components runs the risk of deemphasizing the less tangible, but possibly equally important, aspects of the job, though both McCormick and Cunningham have been addressing this problem. Certainly factors that determine the demand for workers, such as organizational change and the job market, as well as issues raised in the career development literature, are going to be excluded by this micro approach to job analysis. This obviously limits the ability of the job analysis method to explain occupational mobility patterns.

The applicability of job analysis to education seems to be at the detailed level of instructional content, where specific skills and knowledges are to be learned. The kind of variables covered in job analysis are some of the most influencable through conventional kinds of education and training courses. Certainly the consistent use of available job analyses would eliminate many of the skill gaps that occur in vocational curricula. But career education is more than skills training, and mobility is determined by more than education. Job analysis is probably most useful in precisely the context where it is most used, in internal labor markets where skill and tenure are the principal determinants of transfers. The external labor market where changes occur between firms and industries is another matter requiring consideration of other factors.

WORKER TRAITS

The principal alternative to classifying occupations by components of job duties is to classify them by worker characteristics, such as physical abilities and interests. This approach is described by the U.S. Employment Service as an attempt to "reflect relationships among jobs not only in terms of the traditional work performed but also in terms of the requirements on the workers (U.S. Department of Labor, 1965). Most of the systems now in use do not classify information on the basis of such conventional personal characteristics as age, sex, color, family status and years of schooling, let alone such measures as aptitude, interest, achievement, and personality type. Many psychologists now contend that the important components of work can be discovered by studying the interests and aptitudes of students and workers.

Worker traits address two aspects of job choice and performance, namely abilities and preferences. While the boundary is not always clear, the distinction is useful.

Abilities

The most concrete ability traits are categorized in the *Directory of Occupational Titles*, where a major step toward a classification of worker traits was taken in the third edition.

DOT Physical Demands. Perhaps the most obvious of the ability requirements are the physical capacities required of workers to perform a particular job. The DOT defines several: strength; climbing and/or balancing; stooping, kneeling, crouching, and/or crawling; reaching, handling, fingering, and/or feeling; talking and/or hearing; seeing.

Aptitudes. A great deal of research has been devoted to identifying and measuring occupationally relevant human aptitudes. Super and Crites (1962) identify six major types in their review of the aptitude research, and the U.S. Employment Service's *General Aptitude Test Battery* (GATB) contains measures for nine (U.S. Department of Labor, 1965).

Super-Crites	*GATB*
—	Intelligence
—	Verbal
—	Numerical
Spatial Visualization	Spatial
—	Form Perception
Clerical	Clerical Perception
Mechanical	—
—	Motor Coordination
—	Finger Dexterity
Manual Dexterities	Manual Dexterity
Artistic Ability	—
Musical Ability	—

The intent of aptitude measurement has been to ascertain the minimum requirements of jobs and to screen applicants with tests. Norms have been established psychometrically for certain occupations and estimated for all occupations for use in the DOT.

One of the technical advantages of aptitudes is that methods have been developed for measuring both job requirements and worker capabilities, though neither is flawless. Ghiselli (1967) describes the predictive power of tests as being "far from impressive," with maximum coefficients on the order of .30 to .47 for training criteria and .20 to .33 for proficiency criteria, the higher scores coming in specific rather than general tests. Others note the apparent instability of aptitudes, at least as measured (Watley & Werts, 1969). The measurements of aptitudinal job requirements are somewhat better, but still not impressive.

Perhaps most troublesome from the point of view of classification and education is the disparity of occupations that possess the same patterns or aptitude requirements (U.S. Department of Labor, 1962). The disparities in the GATB Occupational Aptitude Patterns are so great that titles cannot even be assigned to the groups. Thus their power as a general analytical construct for analyzing transfers is limited as are the implications for education where assessment is only a means of a developmental end and not an end in itself.

DOT Training Time. The amount of education and training a worker must possess is one of the frequently used ways of describing categories of jobs. Though most commonly described in terms of years of schooling, in the DOT, ". . . Training Time is defined as the amount of general educational development and specific vocational preparation required of a worker to acquire the knowledge and abilities necessary for average performance in a particular job-worker situation."

"*G*eneral *E*ducational *D*evelopment (GED) embraces those aspects of education (formal and informal) which contribute to the worker's (a) reasoning development and ability to follow instructions, and (b) acquisition of 'tool' knowledges such as language and mathematical skills. This is education of a general nature which does not have a recognized, fairly specific occupational objective . . ."

"*S*pecific *V*ocational *P*reparation (SVP) is the amount of time required to learn the techniques, acquire the information, and develop the facility needed for average performance in a specific job-worker situation."

"This training may be acquired in a school, work, military, institutional, or vocational environment" (U.S. Department of Labor, 1972, p. 209). It includes vocational education, apprenticeship training, inplant training, on-the-job training, and essential experience in other jobs. Scoville (1972) also finds this measure hard to convert to the more common years-of-schooling terminology and questions some of the training time estimates.

There can be little doubt that worker traits which describe abilities are critical to the worker-job match. Certain physical demands, aptitudes, and amounts of education are prerequisites to employment, and mismatches between people's abilities and job requirements produce turnover. They likewise pose constraints on occupational mobility and for both reasons are significant in determining the extent of transfer.

Their generality, while a strength in some regards, is also a limitation for analyzing the pattern (as opposed to the amount) of occupational transfers and for planning education. Inasmuch as training time, for example, provides no measure of training content, it can only be used with some indication of job content to ascertain mobility patterns and to plan curricula. Similarly with physical demands and even aptitudes, their power as a general construct for analyzing transfers is limited.

Preferences

Other worker traits, including interests, termperaments, personality, and values, are less immutable (though not altogether alterable), subject to greater adjustment, more subject to personal choice, and are thus more within the province of career guidance.

Interests. Interests are a type of personal trait regularly used in relating people and occupations. The interest categories of the Strong, Kuder, and other interest inventories are categorized by Super and Crites (1962):

> Scientific—an interest in knowing the why and how of things
>
> Social Welfare—an interest in people for their own sake
>
> Literary—interest in the use of words and the manipulation of verbal concepts
>
> Material—an interest in working with tangibles
>
> Systematic, Record Keeping—an interest in keeping records, computing, handling clerical details
>
> Contact—interest in meeting or dealing with people for material gain
>
> Aesthetic Expression and Appreciation—an interest in seeing or hearing works of art

Psychologist Anne Roe (1956) developed a classification system to attempt to define the relationship between worker interests and work. Initially Roe grouped occupations into eight major groups based on the "primary focus" of the occupation, which "are related to most factorizations of interest, although not identical with any of them (Roe, Hubbard, Hutchinson, & Bateman, 1966, p. 387)." The main occupational categories which she defined were (a) Service, (b) Business, (c) Organization, (d) Technology, (e) Outdoor, (f) Science, (g) General Cultural, and (h) Art and Entertainment. Occupations within these categories were then subdivided according to the amount of personal autonomy and responsibility an occupation offers as well as the skill and training required.

Obviously Roe's system does not focus exclusively on worker interests but does emphasize that aspect of work as opposed to technological aspects of the job itself. Scoville provides a good illustration:

> Use of a psychological or worker interest basis for assessing primary focus leads to a number of differences from the classification that would arise based upon the technical focus of the job. For example, miners' work is much the same as many of Roe's "Technology" occupations, but from the viewpoint of interest the "outdoor" nature of the work is overriding. In this case "outdoor" is a shorthand for what economists might term primary occupations—those concerned with agricultural and extractive work. Thus bulldozer operators, whose work is definitely outdoor, appear under the very broad group "Technology" (Scoville, 1972, p. 34).

As a general purpose classification system, one of the greatest problems with many interest classification systems is the extremely disparate sizes which appear once employment is classified on this basis. Roe's categories of "Science" and "Art and Entertainment," for instance, seem to contain

few occupations of very small size, probably constituting only a small percent of total employment. On the other hand, "Technology" appears to contain the vast bulk of employment in the production, movement, and storage of goods. While some small but highly distinctive categories are likely to be analytically satisfactory, a system should not lump a large portion of the cases in one or two broad categories.

A primary issue of this paper is how efficiently a classification system can explain the causes of occupation mobility. If specific causes of mobility patterns could be isolated then we would know which skills, interests or personality traits were actually (and not just theoretically) transferable between certain groups of jobs. Practical applications of Roe's system have not provided convincing proof that her occupational categories effectively predict and explain occupational change. The system was tested by investigation of actual job changes of workers over a 22 year period (Roe *et al*, 1966). The sample, comprised of undergraduate and graduate students at Stanford University, was hardly a national representation. The results showed that 68% of the men stayed in the same occupational group from their first to current job. More reliable figures emerged from Project TALENT. Using the data from this study, McLaughlin and Tiedeman (1974) examined how well Roe's classification scheme ordered changes in career choice. The data show that over a two year period 44.1% of the students chose to stay within the same Roe occupational category. Over a five year period the corresponding figure was 34.2% and over 11 years it was 28.0%. The level of predictability exceeds that of chance but is obviously not very high.

DOT Temperaments. An interesting worker trait included in the DOT is "temperaments" which is defined as the adaptability requirements made on the worker by the work situation.

> Temperaments, as one of the components of job analysis, grew out of the belief that different jobs call for different personal traits on the part of the worker. Experience in placing individuals in jobs indicates that the "temperament" of an applicant is often a determining factor in his success in the job. For instance, a person's dissatisfaction or failure to perform adequately may be attributed to inability to adjust to the work situation rather than the inability to carry out job duties (U.S. Department of Labor, 1972, p. 297).

The categories defined in the DOT are ten in number, including such things as: Adaptability to accepting responsibility for the direction of an activity, influencing people, performing repetitive work, performing under stress, attaining set standards, or adapting to variety in duties (U.S. Department of Labor, 1972).

Temperaments border on a characteristic of the workplace rather than the worker in the work, a topic that will be discussed later. Temperament factors seem to be meeting the test of usefulness in job matching, but empirical research which would shed light on their relevance in explaining occupational transfers is lacking.

Holland personality types. John Holland (1966) has developed a widely used classification of jobs and people, which identified another more general worker trait. Holland's theory is that potential workers can be divided into six major personality types: (a) Realistic, (b) Investigative, (c) Artistic, (d) Social, (e) Enterprising, (f) Conventional. In a similar fashion job environments, primarily influenced by the types of workers holding the jobs, can be divided into these same six categories. Holland argues that personality types will eventually correspond to job types; for instance, Realistic people will find employment in Realistic jobs.

Holland's six main categories are subdivided by assigning individuals second and third dominating personality traits. For example, a person may be primarily Conventional, but also have strong Realistic and Investigative traits, in which case he or she would be coded as a CRI (Conventional, Realistic, Investigative). Thus, the system's six basic categories classify jobs into 54 categories.

Holland arrived at his six categories by analyzing the results of students' V*ocational Preference Inventories* (VPI) which isolated student activities, competencies, occupational choices, and self-ratings. Holland then compared students' personality profiles with their occupational preferences to determine which personality types would pursue which job types. Since he did not test employed workers to determine which personality types dominated particular jobs, he had to rely on the assumptions that students' impressions of jobs were sufficiently accurate and that their predicted occupations would turn out to be their actual occupations . Apparently one test of actual workers has been conducted by Robert F. Morrison and Stephen J. Arnold (1974). The test used a relatively limited sample but discovered that out of 28 traits which Holland predicted would be found in workers in certain nonprofessional jobs, 16 were found at a level of statistical significance.

With a small number of major categories, the system's predictability due to chance is fairly high, particularly since within the six categories a full 72.7% of the occupations fall into the Realistic category. As mentioned above this is a serious disadvantage to any classification system. In this case it throws particular emphasis on the predictive abilities of the second and third variables because by using these variables the number of categories is substantially expanded.

A number of empirical tests have been done in an attempt to verify Holland's theory. Although these tests have indicated that the first variable of the system predicts occupational choice beyond chance most have shown its predictive power to be only in the 25-51% range, depending on the time period tested. Recent samples have indicated that the predictive abilities may be somewhat higher (Nafziger, Holland, Helms, & McPartland, 1974; Holland, Sorensen, Clark, Nafziger, & Blum, 1973).

McLaughlin and Tiedeman (1974) used Project TALENT data to test the Holland theory. The results were comparable, with Holland's system accurately predicting career plans for 57.2%, 44.7%, and 38.6% of the students over periods of 1, 5, and 11 years respectively.

The two more recent studies also tested the predictive abilities of the second and third variables (Nafziger e: al., 1974; Holland et al., 1973). In a sample of 14-24 year olds the second variable ordered 55.5% of the career plans over a one year period and 45.5% over a two year period. Using a sample of 30-39 year olds, the second variable ordered 46.7% of the work histories over a five year period and 38.2% over 10 years. The latter sample tested the third variable's predictive abilities and found that over a span of five and ten years it predicted 43.6% and 39.6% of the work histories.

Recently Holland developed the *S*elf *D*irected *S*earch (SDS) which is based on essentially the same principles as the VPI. Early tests of the SDS have found its predictive abilities to be comparable to those of the VPI (Gottfredson & Holland, 1975).

Flanagan Project TALENT groups. Stemming directly from Project TALENT is another worker traits classification system, this one proposed by the project's director, John C. Flanagan (Flanagan, Tiedeman, Willis & McLaughlin, 1973). By using various cognitive and noncognitive measures Flanagan compiled statistics on students' interests, information, high school record and abilities. He then proposed 12 major occupational groups: (a) Engineering, Physical Science, Mathematics, and Architecture; (b) Medical and Biological Sciences; (c) Business Administration; (d) General Teaching and Social Service; (e) Humanities, Law, Social and Behavioral Sciences; (f) Fine Arts, Performing Arts; (g) Technical Jobs; (h) Proprietors, Sales; (i) Mechanics, Industrial Trades; (j) Construction Trades; (k) Secretarial-Clerical, Office Workers; (l) General Labor, Community and Public Service.

The *Career Data Book* is specifically designed to help career counselors improve their services to high school youth. Flanagan argues that his career groupings should suggest alternative job ideas for many students by giving them an indication of the job interests and abilities which correspond to their interests and aptitudes. But Flanagan did not collect data on job incumbents' personalities and interests. Instead he predicted which jobs students with particular interests and abilities would pursue. The clusters were slightly modified by using the data compiled from the five-year follow-up study. Thus, the only way to test the validity of his occupational groupings is to conduct a longitudinal study to determine if students' interests do in fact remain stable over a period of time.

McLaughlin and Tiedeman (1974) used Project TALENT data to test the predictive abilities of Flanagan's classification system. They found that over a one year period 54.5% of the students chose to stay in the same Flanagan occupational categories. Over five years the corresponding figure was 35.4% and after 11 years it was 28.6%. While the system predicted well beyond the level expected by chance there were still a sizable majority of students for whom its predictive abilities were low.

Katz' values. Another dimension probably significant to career success is values. Martin Katz argues that some congruence between a person's values and the rewards of an occupation is facilitative of success if not essential for continuance. In this sense values act like aptitudes and interests, as constraints and motivators. In a more developmental mode, Katz would add a clarification of values to knowledge of self, knowledge of occupations, and decision-making skills as essential features of career development.

In his work at Educational Testing Service, Katz (1973) has identified a variety of occupationally related values such as Independence, Leisure, and Prestige. While work is underway on instrumentation for clarifying values in people's minds, this work is still young. The parallel problem of proving the value requirements of occupations is also apparent. Despite their striking parallels to field of work or interests, the evidence as to which values are required or otherwise associated with a particular occupation is as yet limited.

In many ways these preferential worker trait systems facilitate career guidance. People can assess their particular interests and abilities and use these data to find their way into jobs which will allow them to use their strengths and minimize their weaknesses. Ignorance of or indifference to mismatches between individual preferences and job requirements undoubtedly contribute to corrective occupational transfers.

Summary Analysis

The worker traits systems discussed here have several common problems. Except for the GATB none of them uses data from actual workers to arrive at their occupational categories. This necessitates empirical verification of each systems' validity. None of the three systems for which tests have been conducted proved to be highly efficient predictors of work histories. The technical issue of how to collect the data appears to be a fundamental problem inherent in all systems using worker traits as a classifying principle. The estimations of worker requirements are going to vary greatly depending on whether you ask an employer, employee or use student interests profiles to determine them. There seems little doubt that worker traits requirements are more difficult to measure than job duties.

It is important to note the aspects of jobs which a worker traits system ignores. All demand-related variables such as the impact of technology on job structure, the state of the economy and hiring practices specific to an organization are left out. Indeed, one source has suggested that Holland's Realistic category is large more because of market factors than individual personality traits (Parsons & Wigtil, 1974).

> . . . job requirements must be conceived as complex patterns rather than in unidimensional terms. . . . data on the civilian occupations and personal attributes of large samples of American military personnel during both world wars provide strong circumstantial evidence that Americans' diverse in educational achievements perform productive functions adequately and perhaps well in all but a few professional occupations. These studies also make it clear that it is not possible to construct an occupational scale according to the intellectual abilities required by diverse occupations (Berg, 1971, p. 41).

In a sense the worker traits systems are more useful as elements of the vocational choice process than as guides which help to isolate common skills in jobs. Perhaps the best educational use of these systems is to teach students to be aware of these worker traits, to assess their own characteristics, and to plan accordingly.

Such efforts have typically been introspective and carried out in a counseling context, but many more education methods could be brought to bear to help students learn about themselves, to understand various job requirements, and to make informed choices. One should not overlook, too the ability to mediate or compensate for these factors through education, once a career choice is made and a particular worker trait is identified as a handicap to career progression.

None of the worker trait factors seems sufficient in itself, even for undertaking career choice, let alone explaining occupational transfers.

Attempting to synthesize the various worker trait dimensions of jobs, the authors of the third edition of the DOT published 114 Worker Trait Groups. Occupations within the Worker Trait Groups show similar patterns of relations to data, people, and things, and fall into such groups as Art work, Accounting-Auditing and related work, Feeding-Offbearing, Cooking, Therapeutic and related work, Journalism and Editorial work. Though the Data, People, Things items have proven not to be the strong hierarchies originally thought, the groups show an interesting potential congruence between general types of job content and rough similarities in various specific worker traits.

The progress that has been made in ascertaining the association of job duties and some of the worker traits is promising. It suggests that additional and broader, methodologically rigorous research may reveal relationships that are useful in explaining occupational transfers and, consequently, in shaping career planning and education programs. At this juncture, worker trait research clearly indicates that education should enable students to understand their own abilities and preferences, in order to improve their career choices. Such self-understanding can also identify developmental needs in areas ranging from physical strength to decision making and the skill to cope with the less desirable aspects of a productive career field.

SOCIO-ECONOMIC CLASSIFICATIONS

Unlike task and worker trait systems, socio-economic classification systems deal with a dimension that is not inherent in the work or the worker. They attempt to describe the status ascribed by society to particular occupations and to rank those occupations in accordance with their levels of status. (This ranking is a crucial feature of socio-economic systems and a feature which raises serious problems, as will be seen later). These systems suffer from narrowly analytical usefulness and difficulty in application.

Though not pure types, both of the occupational classification systems in general use in the United States, the Census occupational classification system and the *Dictionary of Occupational Titles*, are essentially socio-economic in structure. The third edition of the DOT, dated 1965, uses somewhat more of a functional grouping for production occupations and both incorporate numerous compromises with data availability. A third system of the same general type widely used elsewhere in the world is the *International Standard Classification of Occupations* (ISCO) developed by the International Labor Office (1968). As Table 1 reveals, the three systems show substantial similarity in their identification and ranking of broad occupational groups, with a trend away from the "skilled, semiskilled, and unskilled" status grouping of production occupations.

The implicit assumptions required to achieve a status ranking are worth noting. Theodore Caplow (1954) identified five: (a) white collar work is superior to manual work, (b) self-employment is superior to employment by others, (c) clean occupations are superior to dirty ones, (d) the importance of business occupations depends on the size of the business, except in agriculture, and (e) personal service is degrading and it is better to be employed by a firm than in the same work by a person.

These are not the topics that are most pertinent to educational planning, and there has recently been a rash of criticism of existing occupational data from various users of the data. It is important to separate the criticism which has essentially to do with the classification system itself from that which has to do with the collection and tabulation of data, though the two are obviously interrelated. The present discussion will concentrate on the classification systems. Before examining the utility of these systems for understanding transfers and planning education, we should note some basic features of the systems.

One of the basic instabilities is the fact that the entire population does not make consistent discriminations among like occupations. A major finding is that some occupations do not scale consistently because they are rated considerably higher by various population subgroups (Reiss, 1961). This latter fact, the so-called "point of reference phenomenon," was discovered in working with the *Strong Vocational Interest Blanks*. It reflects the fact that "differences among specific occupations are perceived significantly only when the subjects classifying them are from similar occupations. From the standpoint of the unskilled worker, all professional men look alike. From a point closer to their own position, differences between them can be observed (Tyler, 1965, p. 201)."

Many classification systems imply that important differences among occupations are found only in the top few percent of the jobs. This tendency is perhaps a reflection of the point of reference of

Table 1

Broad Occupational Groups in Three Major Socio-Economic Classification Systems

Census 1970	Dictionary of Occupational Titles (DOT) Third Edition 1965	International Standard Classification of Occupations (ISCO) 1968
Professional, Technical, and Kindred (0-1)	Professional-Technical and Managerial (0-1)	Professional-Technical, and Related
Managers and Administrators, except Farm (201-245)		Administrative and Managerial
Sales (260-280)		Sales
Clerical and Kindred (3)	Clerical and Sales (2)	Clerical and Related
Craftsmen and Kindred (4-5)	Processing (5); Machine Trades (6)	
Operatives, except Transport (6) Transport Equipment Operatives (701-715)	Bench Work (7)	Production and Related, Transport Equipment Operators, and Laborers
Laborers, except Farm (740-785)	Structural Work (8)	
Farmers and Farm Managers (80) Farm Laborers and Foreman (82)	Farming, Fishing, Forestry and related (4)	Agricultural, Animal Husbandry, and Forestry
Service Workers, except Private Household (901-965) Private Household Workers (98)	Service (3)	Service
Occupations Not Reported	Miscellaneous (9)	

the systematizer rather than a fact of jobs and status. If so, it is disadvantageous for either educational planning or analysis of occupational transfers.

Status rankings of occupations, being reflections of ratings rather than inherent features of the occupations, are also unstable because they are responsive to a broader set of forces.

> While study of status attainment focuses on individual change sequences, it should not be forgotten that these processes occur within status systems which are themselves subject to change. Though the evidence at present points to a marked stability of occupational prestige rankings in the U.S. over a period of several decades, this fact is by no means a necessity.
>
> A theory of status attainment, therefore, must draw from other areas of stratification research to take into account possible changes occurring in the structure of status systems (Haller & Portes, 1973, p. 55).

Available research leads to the conclusion that a consistent continuum of the status ranking of occupations cannot be achieved. At best, as Hatt's (1950) work indicates, only segments of the occupational spectrum can be so ranked.

A second major limitation is the measurement problem created by the mixing of classification variables. One of the most frequent and fundamental criticisms of the existing occupational data systems is that they combine several variables in defining occupational groups, resulting in a hybridized system which yields data that are not entirely satisfactory for any purpose. Even at the broadest level, the Census and DOT systems reflect several variables in classifying occupations. Hodge and Siegel (1966) of the National Opinion Research Center, offer a number of examples of inconsistency from the Census in their article in the *1966 Proceedings of the Social Statistics Section of the American Statistical Association.* They note the following characteristics used in defining occupations: job duties, certification requirements (e.g., Professional Nurses, Student Nurses), relations to fellow workers (e.g., foremen, leadmen, and helpers), institutional setting (e.g., distinguishing physician's and dentist's office attendants from receptionists and secretaries), industry (e.g., as in the frequent separation of service workers in private households from those in commercial establishments), academic field in preference to function (as in the case of high school music teachers which are classified as "occupations in music" in the DOT, while speech teachers are classified with "occupations in secondary school education").

Such mixtures pose a problem with the use of resulting data in empirical research. Hodge and Siegel (1966) state the problem succinctly,

> Precisely how the industrial and occupational division of labor are intertwined and the manner in which they are intertwined in different sectors of the economy should be an empirical question. But one can hardly conduct any definitive empirical study of their interrelationships if the answer to the question has already been partially built into the data by the use of industrial and class of worker distinctions to define occupational groups. Much the same can, of course, be said, for the use of any criterion other than task similarity to define occupational groups (p. 177-178).

Further problems with the present systems are enumerated by the National Manpower Council (1954). Their analysis illustrates another set of problems encountered in the socio-economic systems, namely that the use of multiple classification criteria results in an uneven treatment of the variables being employed.

Even if multiple variables are used, as in job analysis grouping, inconsistent weighting of various variables creates problems such as those cited above. The point is not that it is improper for a classification system to include a number of different variables, so long as the variables are defined and treated consistently.

In a technical sense, of course, it is not entirely necessary to agree upon a single classifying principle because we now have the capability of making use of multivariable coding. ". . . In this day of the computer it is not impractical to think of a variety of systems, each tailored to a specific set of problems, and our thinking is exactly along these lines" (Greene, 1966, p. 196). Basic detailed occupational units could well be coded to several variables and classified by the researcher in the way most appropriate for his analysis. Nor is multivariable coding a new concept. It has long been conventional to cross-classify occupational data by family and by level. The problem, as we have seen, has been in finding a conceptually and statistically useful definition for such terms as "family" and "level."

Even the so-called "Hollingshead scale," which is based solely on status, incorporates multiple status measures. In attempting to establish an index of social position for their study of social class differences in mental illness, Hollingshead and Redlich (1958) settled upon three characteristics as being most indicative—residence, occupation, and education—and produced the following scale:

1. Executives and proprietors of large concerns, and major professionals
2. Managers and proprietors of medium-sized businesses and lesser professionals
3. Administrative personnel of large concerns, owners of small independent businesses, and semi-professionals
4. Owners of little businesses, clerical and sales workers, and technicians
5. Skilled workers
6. Semi-skilled workers
7. Unskilled workers

Subsequent attempts to identify the single crucial variable in the status of occupations seem to have led to the conclusion that "control" is the most crucial variable. Theodore Caplow (1954) summarizes the argument,

> Indeed there does seem to be one property of an occupational position which correlates almost perfectly with the rank order of prestige rankings. I have called this element "behavioral control." . . . What this element represents is the status of the individual in the typical situations elicited by his occupational role, *vis-à-vis* clients, customers, subordinates, superiors, pupils, passengers, or indeed whatever other persons he normally meets in the course of his occupational duties.
>
> There are in all occupations, without obvious exceptions, an element of behavior control . . . .
>
> It would be absurd to suggest that not other element enters into the determination of occupational prestige. Nevertheless it is worthy of note that the position of the subject with respect to the control of other people's behavior and their control of his, appears to conform rather well to what is reported as occupational prestige (p. 55).

Unfortunately, no classification schemes have been developed based solely on the variable, "behavioral control"; consequently, it is not possible to evaluate the general usefulness of such a system, though it sounds useful for understanding transfers that occur within occupational groups where the substance of the work performed is similar.

The above review indicated that there are substantial conceptual and measurement problems with socio-economic systems, and even strictly status systems do not produce data of particular utility in educational planning.

An empirical test indicates that the Census classification orders work histories rather well. In a survey of occupational mobility, James J. Byrne (1975) found that of those workers who changed occupations about one-fifth of the men and two-fifths of the women changed within their major occupational groups. The rest of the mobility occurred between occupational groups which were closely related. Also, the Census groupings are efficient predictors to the extent that mobility patterns have consistently been more upward than downward when ordered by these clusters (Byrne, 1975).

There is a substantial body of literature dealing with the concept of socio-economic career patterns in the U.S. and these data indicate that the Census groupings are serving a useful purpose for these inquiries. Numerous users of occupational data have observed that occupational data organized on socio-economic bases is of limited utility in planning education, however. James Scoville (1965) has traced the intellectual history of the development of occupational classification systems, and concludes that, "The concept and measurement of social-economic groups stem from nineteenth-century attempts to assess the changing class and skill balance of society (p. 317).[1]

Though the U.S. Census never achieved a purely socio-economic classification, Scoville (1965) concludes from his analysis that, ". . . the identification of groups characterized as much by their social station as their economic functions has been a major feature of United States statistics" (p. 71).

It is understandable why that classifying principle is more appropriate for the consideration of broad questions of social progress than for analysis of the technical content of the jobs. A socio-economic system appears to be of limited use to curriculum planning, because occupations of similar status may show no similarity whatever in type, or even length, of training. For instance, high status occupations include, among others, airplane pilots, bankers, physicians, and social scientists. Moreover, the basic issues of occupational supply imbalances are completely obscured by such groupings.

Jerome B. Gordon (n.d.) reaches the same conclusion.

> Among labor force and manpower specialties, there is a increasing realization that the current classification is not providing useful information for a host of analytical areas . . . . There appears to be too little information on (a) the number of jobs available at different combinations of skill and wage levels, and (b) the number of workers possessing different skill levels at prevailing or expected wage levels.

The problem with socio-economic classification systems stems from a variety of conceptual and empirical weaknesses. Status is ascribed to rather than inherent in jobs, and reflects several dimensions

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[1]For a more detailed discussion, see J. Scoville, The development and relevance of U.S. occupational data, *Industrial and Labor Relations Review*, October, 1965, *19* (1).

of work. The use of multiple dimensions, as in the Census and DOT, runs the risk of inconsistent weighting and, consequently, inconsistent grouping of occupations, whether the purpose is status ranking or not.

To the extent that status is a motivating factor for people to change jobs or for employers to promote people (e.g., to positions of greater behavioral control), it is obviously one of the contextual determinants of mobility. But for the curricular content of career education, it seems to obscure the essential similarities of the jobs themselves.

CAREER DEVELOPMENT

Throughout the preceding sections, notably in the discussion of worker traits but also in the material dealing with job analysis and with status, there runs the theme of individual choice. It is readily apparent that the choices of individual workers are a major determinant of the level and direction of occupational transfers, and most educators, including those engaged in career education, believe that maximizing individuals' choices is one of the goals of education. To the extent that individuals' choices are in fact an active force in initiating and directing job changes and are not simply adaptive responses to changes in labor market demand (which will be discussed in more detail subsequently), it becomes important to see that career development theory adds to our understanding of occupational transfer. Clearly, the decisions of individuals coupled with their work capacities determine the availability of people to supply new or changing labor market opportunities.

Without attempting to synthesize all the various threads of career development theory we can identify several principles that are significant to understanding occupational transfers. Career guidance once hinged on the proposition that worker traits and job requirements must be matched. This proposition, mechanistic as it sounds in its most simplistic formulation, reminds us that such worker traits as aptitudes and physical abilities, especially when taken in combination, are relevant to job choice. Mismatches in these essential traits certainly explain some occupational transfers.

A second important proposition identified with career development theory is that career choice is a process, extending over a number of years of adolescence and, in fact, throughout one's entire working life. The stages involve increasing understanding of oneself and the labor market, often gained experimentally by the young. Certainly misinformation about self or about jobs and the fairly common experimentation in early work histories accounts for a certain number of occupational transfers.

Related to the matter of occupational transfers is the broader notion of self concept, by which an individual gradually forms an image of himself or herself and then translates it into operational terms and implements it such that career development becomes a part of human self development (Super, Starishevsky, & Jordaan, 1963; Hansen, 1970).

The significance of adult career development is receiving increasing attention and has prompted Ginzberg (1972), among others, to reformulate his theory, extending the notion of career development from the period of "prepuberty until the late teens or early 20's when the individual makes a definitive occupational commitment," to a lifelong matter when "occupational choice is a process that remains open as long as one makes and expects to make decisions about his work and career. In many instances, it is coterminous with his working life" (p. 167-172).

There were essentially three factors which prompted Ginzberg (1972) to this modification.

> The first and most important is the feedback mechanism that exists between a man's original career choice and his work experience. If the satisfactions that he sought originally are not forthcoming, or if as a result of this working he becomes aware of new career possibilities that promise greater satisfactions, it

> is likely that he will endeavor to make a new choice. The probability of his venturing the attempt and succeeding in carrying it out will be affected by two related factors: (a) the degrees of freedom that he has as a result of changing family circumstances, i.e., if his children are grown and his savings allow him to take a year off to explore a new field; and (b) the pressures or options arising out of his job situation that force him to look for new employment or which enable him to accept early retirement (p. 170).

Other physiological and psychological aspects of aging should also be noted.

Ginzberg's revised theory reflects in large part the increasing mobility of the middle-aged work force. While it is undeniable that career changes occur most frequently early in a person's work history, there is, as mentioned in the introduction, significant mobility throughout all labor force groups.

> The press recently dramatized a number of case studies of individuals, mostly men in professional and business positions, who have made drastic leaps from one type of occupation to another seemingly unrelated one. Whether this phenomenon is called the middle-aged work crisis, male menopause, or mid-career depression, more signs of it seem to be evident (Sheppard, 1971, p. 89).

For career development theory what is most important about the trend toward middle-age career change is the motivations behind it. The evidence indicates that some of these middle-age career changes are motivated by psychological needs such as job satisfaction, rather than material or financial needs such as money or success (Leider, 1974). An important study conducted by Harold L. Sheppard (1971) summarizes the characteristics which differentiate a second career candidate from someone who is likely to remain in the same occupation.

> First, there is little difference between the two types insofar as hourly wages or their felt adequacy regarding take-home pay; second, the two groups are virtually identical regarding family income; third, there is no overwhelming contrast regarding education, although one might expect to find the average education level of the candidate group higher since they tend to be the younger members of the 40-plus men's sample. The critical point is that the usually considered economic variables such as income and/or adequacy of take-home pay do not appear to contribute to an identification or understanding of the second career candidate.
>
> It is the social-psychological sphere where differences between the two groups appear. For example, the candidates for second careers have higher achievement values . . . on the behavioral level, a higher proportion of the 40-plus candidates report that they actually have tried to get into really different work (p. 92-93).

The critical proposition here is that most people do not settle down in a career once and for all. Their physical and psychological attributes change even without traumatic events such as accidents, their preferences change to some extent, and their obligations and opportunities change with time. These factors prompt Gross (1967) to suggest a classification of occupations in terms of their appropriateness for various stages of the life cycle, from entry occupations to peak career occupations.

This trend poses a distinct challenge to all occupational classification systems. They must not only explain original career choice but occupational transfers during the various stages of a person's working life. The variables which determine career choice early in a person's life may be at least partially replaced by other variables during the course of that person's work history.

These observations suggest that some major portion of occupational transfers will be linked to individual, nonwork situations. "These facts clearly suggest the need to view career change as multi-dimensional behavior. Career studies, especially those with a developmental orientation, are still few and far between" (Lieder, 1974, p. 45).

With this developmental orientation, it is not surprising that career development is involved with decision making. A number of career development theorists have emphasized the decision-making elements of that process while others have contributed useful material to the improvement of those processes, particularly by youth. Two of the essential elements have already been identified, namely knowledge of self and knowledge of work. The other important element is decision making skill in using that information. Decision making is also an essential element of the occupational transfer process, and many would say it is a precondition to any occupational transfer, particularly one that proves to be successful.

While career development theory has not produced an occupational classification system *per se*, it does contribute substantially to our understanding of individual decisions to undertake a change of occupations and as such provides a useful context for analyzing occupational transfers. It indicates that there are a number of important considerations beyond those which are inherently occupational that may go into an occupational transfer, particularly among mature workers. It also strongly suggests that efforts on the part of education to increase the appropriateness of occupational transfers or to improve the prospects of their being successful requires attention to various aspects of maturation and decision making.

CURRICULUM CLUSTERS

Taken together, career choices and skill training are the major factors shaping the supply of labor offered by the population. Occupational preparation is so much a part of education at all levels that its influence on occupational transfers hardly seems to need discussion. The chronic debate over the appropriate amount, type, and timing of vocational preparation for the young and the associated personal and social costs and benefits thereof sometimes overshadows the fact that occupational preparation is part of the educational process for the majority of American youth. In looking at the Current Population Survey data, Byrne (1975) observes that occupations requiring substantial training, such as professionals and managers, tend to have low mobility rates, while those requiring less training show higher mobility rates. In his independent analysis of middle-aged men, Kohen (1975) finds that, "Holding base year occupation constant, the probability of upward movement and the distance of movement are positively related to the years of schooling completed by the worker. There is also some evidence that other types of human capital resources (e.g., formal occupational training) make a contribution under certain circumstances" (p. 148). Thus the association between education and work at labor market entry seems to persist and to affect occupational transfers as well.

These patterns, together with the recent emphasis on career education, have prompted recent attempts to develop occupational classifications based on the concept that curriculum areas can serve as a basis for classifying jobs.

USOE Occupational Clusters

Hospitality and Recreation
Manufacturing
Public Services
Personal Services
Marketing and Distribution
Construction
Consumer & Homemaking Education
Fine Arts and Humanities
Transportation
Marine Science
Communication and Media
Health
Agri-business and Natural Resources
Business and Office
Environment

The above clusters identified by the U.S. Office of Education (1971) have been matched by efforts in several states to identify career education clusters.

While some good job analysis is done in these efforts, the desire to relate occupations and curriculum areas can lead to some confusion of the dependent and independent variables. Whereas the intent of vocational curricula is to relate education to the labor market, curriculum area classification systems propose to classify occupations in terms of the established areas of curriculum specialization. This approach makes the Procrustian error of attempting to fit the labor market to the existing education structure. Thus, such a system contains the inherent danger of failing to describe the labor market so much as the institutional arrangements of schools.

Another weakness of such a system is also illustrated here. Attempts are made to draw a distinction between academic subjects and vocational subjects, but no such distinction exists in the labor market.

Such systems often go even further in limiting the learning they consider to be relevant. By purporting to define the "teachable content" of jobs, they exclude sometimes necessary skills which are not judged to be "teachable" in a classroom setting. Despite great strides being made by applied psychology in teaching social skills (e.g., assertiveness, parenting, leadership), the so-called "teachable content" of jobs usually turns out to be the technical skills, while the social skills which are sometimes more important are omitted from consideration. A classification system based on such a limited view of things obscures similarities and misses essential characteristics of many jobs.

Another great weakness of such a system is the premise that immutable curricular requirements for occupations can be defined, while in fact there is great variety in the ways occupational preparation can and does occur. With the exception of regulated occupations where the means of entry into the occupation is restricted by force of law, a person can prepare for almost any occupation in a variety of ways. The substitution of relevant experience for formal education is a common practice, while the specific educational or experience requirements are even more variable. Any classification system must recognize that "substitution exists in two directions: sometimes one occupation can be held by people with different types of education; in other cases with the same type of education one can find employment in various occupations" (Tinbergen, 1962, p. 16).

In this regard, the International Labor Office (1958) recognized that a worker's occupational qualifications, "or the combination of skill, knowledge and ability which he brings to his work," are relevant to an understanding of occupations, but they judged occupational preparation not to be a suitable classifying criterion because " . . . firstly, occupational qualifications are not absolute, and secondly, their measurement is frequently a matter of judgment" (p. 3).

These factors produce what Taylor, Montague, and Michaels (1972) observe to be a fundamental lack of agreement on conceptual variables and criteria underlying the development of vocational education clustering systems. None of the present clustering systems satisfied their attempt to formulate a cluster system for career education, so they proposed various cross-classifications, including their own listing for educational processes:

1. Communication
2. Social, Political and Economic
3. Art
4. Tool and Handcraft
5. Physical Development
6. Interpersonal
7. Mathematical
8. Scientific
9. Technological

This is an educational taxonomy. Whether to use one of the existing ones (which, by the way, are no more satisfactory for classifying subject matter than the established occupational systems are for classifying occupations) or a new one is another question. Whatever the system, it is as difficult and misleading to try to fit occupations into an educational taxonomy as it is to try to subsume all education under occupational categories.

To say that is not to depreciate the value or relevance of education to work, but simply to recognize that they are different. Cross-classifications of the two are a much more feasible and useful undertaking than trying to subsume either one under the other. Certainly much work is needed to define and document that relationship. There are two streams of inquiry here. One is best represented by the question, "How do I prepare to become a (*occupation*)?" As we have seen, the answer is usually, "It varies," but we need to be more precise than that. The other question is, "What do I do with a degree in (*program*)?" The answer is not found simply by looking at the program title (Electromechanical Engineering Technology, Political Science), but graduate follow-up data are too incomplete to provide definitive answers.

Certainly education has an effect on occupational transfers, and a better understanding of the real relationship of education and jobs is crucial to educational program planning.

It seems that curriculum has little to recommend it as an occupational classification system. As has been seen, it reverses the dependent (curriculum) and independent (occupation) variables in occupational preparatory programs; it tends to omit major areas of knowledge and skill that are occupationally relevant; and it implies an unwarranted absoluteness in the means of occupational preparation. It seems appropriate to reject curriculum areas as a classifying principle, even for vocational education curriculum planning, and to look to the more basic characteristic, job content. To deny the appropriateness of curriculum areas as a basis for classifying occupations is not to reject the importance of education to career choice, but to recognize the difference and the subtlety of the relationship. Thus, while a worker's education may help us understand his or her occupational transfers, and a good subject matter taxonomy is essential to curricular planning, one cannot adequately describe occupations in educational terms.

WORK ENVIRONMENT

Because work occupies so much of one's time and because it has great social and psychological value in addition to its physical demands and economic benefits, the work environment, along with social status and the labor market, proves to be one of the important contexts within which jobs are performed.

The data on job-shifting argue strongly for the conclusion that the average worker holds many jobs in a lifetime. A high proportion of these will involve different employers and, therefore, different organizations (Gross, 1967). There may be advantages or disadvantages to movement within firms as opposed to movement between firms. Kohen (1975), in the follow-up of middle-aged men, found more status gain and less change of occupation among those who stayed with the same employer, but that job changers, especially those who do so voluntarily, often derived as large gains in wages as those who stayed.

The most physical of the environmental conditions are defined in the DOT, and include inside-outside, extremes of temperature, wetness, noise, hazards, and air quality. However, the term should be understood broadly to include social and organizational aspects as well. As with communities and other groups, many of the positive and negative features of work organizations are ill defined and seem quite intangible but are, nevertheless, influential on people's choices and perhaps their career development. Whether Gross' (1967) analysis portends the future, it does illustrate the significance of work environment.

> The dominant characteristic of modern Western urban industrial society is that it seeks to attain all of its larger goals through large-scale organization. Whether the goal is producing goods, healing the sick, protecting society from criminals, protecting society from foreign enemies, or educating the young, the characteristic approach is to form an organization with goals and a structure (p. 417).

Industry is one of the well established characteristics of work organizations. The *Standard Industrial Classification* (SIC), used almost exclusively for this purpose in the United States, classifies establishments on the basis of their principal product or service. It covers the full range of economic activities from agriculture to services, and includes several useful levels of detail (e.g., services, personal services, barber shops). Industry may determine the existence of certain occupations, as for example production jobs; it may explain substantial variation in wage and benefit packages (U.S. Department of Labor, various years), and it may influence some of the less tangible aspects of the work environment, such as the size of organizations, managerial traditions, and relationships among workers. Certainly there are important characteristics beyond specific tasks that distinguish legal secretaries from secretaries in construction firms from secretaries in large federal agencies, though there is considerable environmental variation within industries and, for that matter, within firms.

Both Ginzberg and Gross point out the preeminence of industrial and firm attachment on the careers of people in blue-collar jobs.

> The career development of the noncollege group will be materially affected by whether or not they succeed in obtaining employment with a large company that has an internal labor market with training and promotional opportunities geared to seniority. If a young worker succeeds in joining such a work force, the key decisions about his career follow. The occupational decisions that he made earlier will be of relatively little significance (Ginzberg, 1972, p. 171).
>
> It is particularly important for workers at the lower end of the prestige hierarchy, many of whom feel that any type of enduring employment is superior to the chaotic work experience that most of them are forced to endure. The ability of the individual to do without organization supports in his quest for security might be taken into account by the vocational counselor (Gross, 1967, p. 418).

It becomes apparent from this discussion that occupational attachment is flavored by features of the work environment which may be quite independent of job tasks.

Rene' V. Dawis and Lloyd H. Lofquist (1975) at the University of Minnesota have posited that an individual's job satisfaction is dependent on how closely his or her abilities and needs correspond to the ability requirements and need-satisfying conditions of the work environment. The *Minnesota Satisfaction Questionnaire* (MSQ) and the *Minnesota Importance Questionnaire* (MIQ) rate jobs and people according to how important 20 "work-reinforcers" and "vocational needs" are to them. The work reinforcers include such items as ability utilization, creativity, security and supervision (Dawis and Lofquist, 1975). By using the Occupational Aptitude Patterns of the U.S. Department of Labor and Occupational Reinforcer Pattern Clusters developed from the MSQ, the University of Minnesota group developed a classification system based on two sets of dimensions: abilities and needs.

These authors have posited a Theory of Work Adjustment which argues that the individual and work environment actively interact with each other (Dawis and Lofquist, 1976). Incongruent work and personality styles tend to repel each other and congruent styles result in workers who stay in the same occupation for a longer period of time. Dawis and Lofquist believe that by determining a person's personality style a counselor can help to guide that individual into occupations which will reinforce his or her vocational needs.

The approach of the University of Minnesota group is useful in two major respects. First it views occupational choice as a constantly evolving process and allows for constant changes in the composition of the worker-work environment interaction. This is consistent with recent research which indicates that career development is a lifelong process. Second, the Theory of Work Adjustment defines work in multidimensional terms, including both abilities requirements and aspects of the work environment in its conception of work.

It should be noted that this work is based in part on Holland's personality theory and on the organization of occupations in the DOT. Thorough empirical testing is still needed to determine if personality types really do choose congruent work environment types. Proof that this system effectively describes career choice is yet to come.

The growing literature on job satisfaction, with its substantial attention to environmental factors, further attests to the importance of this dimension of work.

Some progress has been made in the job analysis work of both Cunningham and McCormick. Both have identified some work environment variables. Cunningham's *Occupational Analysis Inventory* lists 77 that factor analysis of 1,414 occupations grouped into 14 categories, including incentives,

physical hazards, work schedule, conflict situations, social and civic obligations, rush situations, social service context, and authority over others (Boese & Cunningham, 1975).

There have been several other attempts to define and establish the importance of "organizational climate." The organizational climate analyst does not study individual skills and jobs but the different situations under which similar skills are exercised (Schneider & Bartlett, 1970). Through this approach researchers have tried to isolate those aspects of the work environment which explain job satisfaction and, by implication, mobility patterns.

The state of this research is not yet very advanced. Benjamin Schneider (1972) of Yale University concludes that "There is both little data, and little theory that suggests the manner in which an employee selects one organization over another" (p. 271). The first problem is to define what an organizational climate is. Most researchers have taken the subjective approach and treated the organizational climate as the individual's perception of his work environment (Downey, Hellriegel, & Slocum, 1975).

The absence of a definition of organizational climate based on qualities which inhere in a particular organizational setting leaves open the possibility that there are as many different climates as there are people, since everyone may perceive his or her environment differently. Some of the most extensive research in the field has been conducted by Benjamin Schneider and C.J. Bartlett. Their study of employees of a life insurance company indicated that different employees do perceive their climate differently. "The data presented argue strongly for caution in drawing conclusions about the climate or any other perception-based statement, regarding an organization and its members" (Schneider & Bartlett, 1970, p. 509). In another place Schneider (1972) concludes "There is probably no such thing as *the* organizational climate" (p. 212).

The worker-oriented nature of the organizational climate research is reflected in the types of variables commonly used to measure climate. Most of the "scales used in the construction of climate instruments . . . are generally formed using items from already existing (job) satisfaction measures" Downey & Hellriegel, 1974, p. 234). This may be because most of the instruments have been developed by psychologists (Hellriegel & Slocum, 1974). Six variables used by many researchers to define an organizational climate are: decision-making, warmth, risk, openness, rewards, and structure (Downey & Hellriegel, 1974). Somewhat surprisingly there seems to be a fairly solid consensus that these items should be used to define organizational climate.

While much of the research has shown correlations between satisfaction and organizational climate, there appears to be little research that correlates worker perceptions of their environment to mobility rates. This would be an important step toward isolating how important a causative element organizational climate is in workers' career choices, particularly in light of Herzberg's earlier conclusion that satisfaction is related more to job content than to work setting, at least for professional workers.

Herzberg and his colleagues, in research with professional workers, distinguished satisfiers from dissatisfiers (Herzberg, Mausner, & Snyderman, 1959).

Satisfiers—related to the job	Dissatisfiers (or hygienic factors) related to the job
achievement	company policy and administration
recognition	technical supervision
work itself	supervision of human relations

Satisfiers—related to the job	Dissatisfiers (or hygienic factors)—related to the job
responsibility	working conditions
advancement	salary
sometimes, salary	

Hellriegel and Slocum (1974) summarize the challenge facing researchers in this area. " . . . Few studies have achieved a sophisticated level of research rigor. Possible reasons for these results are that climate dimensions must be further redefined and operationalized, longitudinal experimental field designs have not been undertaken, and researchers have not controlled for the impacts of structure, technological or environmental uncertainty or climate perceptions" (p. 277).

The realm of work environment, defined to include social and organizational aspects as well as the physical surroundings, seems a promising area for study of job changes, including occupational transfers. Industry is clearly one of the significant variables; it has been both classified and shown to be a strong influence on the career patterns of production workers. Other aspects of the work environment, as yet only preliminarily defined, may also prove to be influential and increase the attention that must be paid to this topic in understanding occupational transfers. At present, however, we can only monitor the growing research literature in this area directly and recognize that useful taxonomies come later.

LABOR MARKET DEMAND

As much as transfers reflect personal preferences, they also reflect the job opportunity structure that results from the consumption and production decisions of others. Thus, the economy at large is part of what determines both the absolute and relative labor market demand for various occupations. There is no need to describe the functioning of the market, to demonstrate the fluctuations in market demand, or to array occupations on a shortage to surplus continuum, for the influence of all these forces on transfers is apparent.

Occupational transfers are an extraordinarily important mechanism of labor market dynamics.

> The single most important component in determining the rate of growth of an occupation during any decade is the volume and direction of net mobility. Occupations which grow rapidly are those into which there is considerable net mobility. Large numbers of new entries from among youth who are entering the working force is not enough to insure the growth of an occupation. On the other hand, the occupations which either grow slowly or decrease in size do so because of large-scale out-mobility rather than because youth do not enter them or because of retirements or deaths (Jaffe & Carleton, 1954, p. 27).

Recent research is shedding new light on the dynamics of these changes, and two observations have particular meaning for this paper. One is that the market not only presents an opportunity structure to the individual, but influences his or her own propensity to undertake transfers (Parnes & Nestel, 1975). A second is the fact that hiring requirements change with the labor market. This general proposition is documented by Freeman (1975) in his paper on the relative position of college and high school graduates in which he found college graduates taking over positions where high school graduates formerly found employment. Such evidence demonstrates that the level of market demand not only has a profound influence on the opportunity for occupational transfers but influences many of the variables that classification systems use by affecting worker attitudes, altering hiring requirements, and swamping status as a pointer for the direction of individual occupational transfers.

While market forces explicitly determine the level of demand, employer practices help shape its structure. Some of the more negative aspects of prejudice and convention are well known. Doeringer and Piore (1971) have shown that the job opportunity structure is subject to administrative structuring, with some positions open to all applicants and others reserved to the firm's "internal labor market." In the same vein Scoville (1972) argues convincingly that job structure is not technologically determined in most cases but is amenable to modification if not outright restructuring in response to employer and worker preferences. Such propositions further indicate the interrelated nature of job structure and transfer opportunities.

Looking at wages, grade, status, and potential for advancement within firms, Cassell, Doctors, and Director (1972) concluded that " . . . no single measure of job mobility is sufficient to describe the very complex changes that occur in an employee's career path during his tenure with any given company" (p. 141).

Occupational labor market demand has traditionally been categorized as shortage-balance-surplus depending on its relationship with available supply of workers.

Examined above, occupational outlook is sometimes categorized only in terms of growth rates, as in the 1976-77 *Occupational Outlook Handbook* where individual growth rates are described as much faster, faster, average, slower, little change, decline (U.S. Department of Labor, 1976). Though growth is a good indicator, demand is also created by deaths, retirements, and other labor force withdrawals, and that element is sometimes included in categorizations of demand relative to base year employment, usually also stated in terms of high-average-low rates. For purposes of transfer analysis, this formulation is probably most useful, though for such purposes as program and career planning it is essential to examine the interaction of demand and supply. That interaction is best described on a shortage-balance-surplus (of applicants relative to jobs) continuum. Such descriptions of labor market demand, or of demand and supply, are crucial to both the explanation of occupational transfers and the planning of career education.

SUMMARY OF MAJOR CLASSIFICATION APPROACHES

Several generalizations come to the surface in this review of occupational research. First, work has attracted the attention of most of the social and behavioral sciences and several major research traditions have developed. The closest to the work activity itself is the rigorous, detailed work in job analysis where jobs are analyzed for their behavioral components. The results have been used to plan specific skill training and, to a lesser extent, job restructuring. This attempt to understand the basic elements of jobs has produced useful descriptive tools, and there is promise that the action verb lists or other job analysis tools may produce a generalizable framework of tasks for classifying occupations, and that structure is beginning to emerge from the highly detailed work of job analysis.

Recognizing that a suitable match is needed between human traits and job requirements, conscious of the need to aid individuals in the selection appropriate fields of work, and building on psychometric advances in measurement, psychologists have defined and classified a number of worker traits, ranging from job determined physical demands to interests and temperaments, and even value priorities and personality types associated with various occupations or field of work. While each of these traits is related in its own way to work, there has been no satisfactory synthesis, and the more general traits face problems of measurement and documented linkage to jobs. Being distinct from the content of jobs, most worker traits (with the possible exception of interests) do not categorize occupations in ways that represent their essential characters.

The dominant method of occupational classification, socio-economic status ranking, faces the same problem. Conceived to shed light on questions of social progress, socio-economic systems are still more useful for that purpose than for understanding work itself or for planning educational and other job-related programs. Nevertheless, such systems describe part of the social value ascribed to occupations, a dimension which is not ascertainable from the detailed work of job analysis.

The socio-economic classification of occupations demonstrates a generalization of major importance to understanding an occupation, namely that an occupation is more than the sum of its tasks. It carries with it major personal, social, and economic implications. Consequently, career selection and occupational transfers both influence and are influenced by a host of social and economic dynamics.

One of the developments influencing the available supply of people to work is the growth of career development services. This service area, while concentrating on the initial career choice of adolescents, has developed a number of principles that are significant for an understanding of occupational transfers, including the proposition that career development is not an event but a lifelong process that is strongly influenced by a person's self concept and intertwined not only with lifestyle but with personality. Substantial advances in decision-making skill and in the accessibility of relevant personal and career information have followed. All further emphasize the progressive, dynamic nature of the individual as well as the labor market.

Educational efforts to facilitate the preparation of youth for jobs have concentrated on occupational skill building, and have produced some attempts to classify occupations by their "teachable

content." These programmatic and taxonomic efforts highlight again the skill content of jobs and the necessity to relate various kinds of knowledge to that job content, but efforts to categorize occupations under educational program headings seem an unpromising path to follow. Career education program efforts do, however, recognize the crucial interface of personal preference on the supply side and the demand for workers on the other, an essential and influential dynamic that tends to get lost in many other approaches.

There is much that can be said about the environment within which work takes place, and more that needs to be said. The importance of understanding and making that environment attractive is becoming apparent through the research on job satisfaction. While the classification of work environment is still rudimentary, some of the traditional descriptors such as size and industry are powerful and significant for an understanding of occupational transfers, especially in those production processes where worker attachments are more industrial than occupational. Descriptors of work environment are now being tested which may be analytically useful with occupational transfers.

One of the primary determinants of occupational transfers and the demand for job skills is the organization and functioning of labor market demand. Economic shifts in production methods and the market have subtle but profound effects on virtually every dimension of occupations, including tasks, worker requirements, and career development strategies such as training. By the same token, the organizational decisions of firms help shape career ladders and opportunities as surely as changes in technology and markets. Demand, together with the behavior of workers and job seekers, determines hiring requirements and the sequence of the employment queue.

These overarching influences lead to the inevitable but important conclusion that all of these dimensions of occupations are important. They all add significant understanding to our knowledge about occupations. Any attempt to understand and plan for occupational transfers must approach occupations in a way that gives credence to these various features of the work itself, the people who perform it, and the social and economic milieu within which it occurs as well as the training that can facilitate both initial placement and long-term success. Occupational transfers are a function of numerous factors. These various dimensions of jobs and their classification schemes become limiting only when the analysis is restricted to one type of variable.

It is apparent from the research cited in this paper that much of the good work in all of these areas is still at relatively early stages of development. As has been seen in the paper, there are few full-blown occupational classification systems, and those address in only a limited way the issue of transfers and education. What is known is largely descriptive and there has been limited testing of the analytical power of the various concepts. As Haller and Portes (1973) observe,

> For the most part there is a paucity of causal explanations of mobility at the individual level. The magnetism exercised on researchers by the mobility problem has meant almost exclusive concentration on description—analysis of conventional mobility matrices per se—to the neglect of explanation—study of the possible determinants of observed status movements. Identical mobility scores may be the result of quite different causal configurations making simple, homogenous explanation inappropriate (p. 52).

At this stage, the Census socio-economic classification has received rigorous review, data are becoming available upon which the job analysis and worker trait constructs can be judged, and the others are still at the stage of theoretical constructs, often without explicit classifications or with illustrative examples that need to be tested. Recognizing the importance of the job dimensions addressed by each and the newness of much of the methodology, it is impossible to say what has

been proven or to judge what is irrelevant; certainly nothing we have seen is definitive. Like so many of today's social concerns, our topic is not understood in terms of one single causative variable. Rather, more of a systems analysis is required wherein the dynamics of the various elements and relationships are made explicit and synthesized rather than assumed static.

ATTEMPTS AT A GENERAL PURPOSE SYSTEM

What seems desirable is an approach that transcends the limitations of present approaches, each of which tends to look at one or another particular aspect of occupations, to the exclusion of some other important dimensions. Such a system would need to encompass a number of important aspects of work to indicate that these various components are not simply independent variables but have meaning in their interrelationships with other variables. This approach would be an important theoretical break with the past, but would draw heavily on the work already done by current disciplines.

Job content would have preeminence in such a system, for the system must emphasize the fundamental similarity of occupations within the various job families or clusters.

There has been some recent examination of the problem and attempts to clarify the problem in the work of the present author, the work of James G. Scoville, and the efforts of the committee on a standard occupational classification.

In looking at occupations, a broadly applicable principle of classification seems to be the "function" of the job. While the importance and explanatory power of various specific features of jobs differ depending on the job and circumstance, all occupations have some primary "function" which they perform and which, thus, may serve to identify the essence of the job. It thus seems potentially useful to consider function as a single but general purpose criterion for classifying jobs and to see how it facilitates the understanding of transfers and the planning of education.

This terminology involves standard dictionary usage: "a special duty or performance required of a person or thing in the course of work or activity: as, the *function* of a policeman is to protect and assist the public" (Webster, 1966, p. 586).

In reviewing the literature on occupational classification, one is struck with the frequency with which people have identified the importance of a job's function, and yet the idea has been little pursued.

In discussing the uses of occupational information generally, James Scoville (1965) says,

> Two major aspects of jobs can be identified which serve to describe their job content. The principal technical, material or functional focus, on the one hand, and the level of complexity on the other. The first dimension thus, places the job in a family of jobs centered about some characteristic function of "locus of attention" (p. 319-320).

The concept has also been identified by numerous other writers.

In an attempt to outline a functional classification, McKinlay (1971) has identified five broad functional categories.

Job Category	Function	Clusters
Organization Management	Direction and Control	Administrative, Clerical, and Bookkeeping-Accounting
Technical Services	Technical Support	Social Research & Planning, Engineering & Design, Laboratory, Mechanics, and Building Maintenance
Production	Processing of Goods	Agricultural & Forestry, Construction, Food Products, Textile & Apparel, Timber Products, Graphic Arts, Metal Working, Electricity & Electronics, and Other
Distribution	Distributing Goods	Transportation, Stock Control, Sales, & Food Service
Direct Service	Providing services directly to people	Health Service, Social Service, Protective Service, and Art & Entertainment

The classification scheme has two more major levels of detail. Within each functional grouping are occupational clusters. Jobs within each cluster are related to a common, fairly specific function such as providing health services. The third level of detail—individual occupations—uses the standard definition of individual occupations based on job duties.

While the functional classification of occupations is based on a single factor, its claim is to more centrality and therefore more general applicability and more analytical power than single element systems. It is interesting to note the common definition of occupation and the similarity with parts of other systems. Socio-economic sales, clerical and managerial groups of socio-economic systems have their rough counterparts in the Sales, Clerical and Bookkeeping-Accounting, and Administrative clusters of the functional scheme though they are not arranged in hierarchical order. These are likenesses with the U.S. Office of Education instructional areas with titles such as agriculture, health occupations, office occupations, and others, finding a rough counterpart in the functional system. Emphasizing the purpose of jobs, and specifically skill content, has similarities with the job analysis research. Most interestingly a functional classification scheme also shows promise of incorporating some of the broader dimensions which the worker traits have identified. The structure, at least at the broad functional level, appears to reveal the unique way in which persons in various functional groups view their jobs. For instance, it seems apparent that people in direct service occupations share certain attitudes about working for people's presumed good which contribute to their own satisfaction and occupational effectiveness and are distinct from workers in other broad functional groups.

Clusters of a functional classification seem well suited to use in the formulation of curricula areas for career education, because they reflect similarities of function and broad skill areas. They also meet the vocational educators' need for groupings of occupations having broad similarities of skill and knowledge. Although the functional occupational clusters do not classify occupations explicitly on the basis of their similar knowledge, the occupations within most clusters do exhibit skill and knowledge similarities.

Any analysis of the functional classification system remains, of course, less than definitive at this stage since the system has not been subjected to thorough scrutiny and empirical tests. Only with experience will it be known how useful this concept is for revealing common elements in jobs and ultimately job transfers. What does seem important, however, is that the nature of the system seems to escape the limitations of other systems which concentrate on only one aspect of work. From an analytical standpoint, functional classification offers the advantages of a common, job-oriented context, but one that reveals significant trait variables (skills, types of training, worker interests) and environmental variables (socio-economic status, economic outlook) in relation to a simple and clearly defined classification scheme which revolves around the primary focus or function of a job.

The recent work of James G. Scoville (1972) has much in common with the pursuit of a general purpose system. Scoville is critical of existing classification schemes for their unidimensional nature. He argues that work is multidimensional and that concentrating on a strictly defined classification system is likely to force "a given set of data to perform tasks to which those data are ill-suited" (p. 9).

Scoville (1969) proposes that a classification system be built up according to its own internal principle by concentrating on gathering job data which will define empirically the importance and interrelationships of the various components of work. He isolates three general categories of variables which serve to define a job and explain the structure of the labor market: economic concerns of management, economic concerns of workers, and the influence of present technology combined with the types of jobs available. This system obviously centers on the influences of the market aspects but also incorporates other features of jobs. Scoville (1972) elaborates on the importance of a classification system accounting for various occupational characteristics:

> The model bears upon the whole question of classification by stressing the interrelationships between job content, wages, turnover, training, and the like which are often ignored or forgotten when one starts with a final classification in mind and squeezes the data to fit it. More important, however, is the value of integrating a number of factors (technology, education and training, income, interpersonal status relationships in the workplace) as parts of a single picture, rather than allowing these factors to appear as separable and independent "principles of occupational classification" (p.117).

By analyzing a comprehensive pattern of variables and interrelationships Scoville (1972) hopes a classification system can be developed which will "reflect the relationships between jobs in terms of training commonalities, promotion and mobility patterns, and the balance between general and vocational education" (p. 12). These are certainly the areas of need which this review of classification schemes have pinpointed. Clearly many of the needs of educators would be met if such information were available.

Such a derived classification is another attempt to find a generalizable classification of occupations. Scoville has suggested a tentative optimality model for determining just what effect management and worker decisions, as well as the structure of the job market, have on determining job content and labor mobility patterns.

The model focuses on how the parameters of a job are defined. For instance, management may decide it wants jobs with relatively broad or narrow skill requirements depending on how large the firm is, what sort of technology is currently available, and how many retraining programs the company wants to finance . Ultimately the company will combine these and other factors to determine what is for them the most efficient division of labor.

Workers on the other hand have their own set of interests which will influence the breadth of content of their jobs. By and large trade unions have attempted to keep job requirements broad to give workers benefits such as job security, easy relocation, and job satisfaction. In addition to these factors the state of the economy is bound to influence the size of the labor market and ultimately the format of jobs.

Scoville's model seems to incorporate a degree of flexibility and hence probably a more accurate description of the labor market than most present systems. For instance, such a model would be sensitive to the fact that workers in a particular job may behave differently at various times according to the size and type of organization where they are employed, the state of the job market, or their own changing personal interests. Such a system seems likely to mirror some important occupational dynamics.

A third important attempt at generality is the work of the federal Interagency Committee on Occupational Classification. This work, now in draft stage (Office of Management and Budget, 1975), attempts to provide a broad framework for cross-referencing and aggregating the various incompatible systems now in use by federal data agencies and others out of government. Like the other new efforts, it focuses on the work performed and takes note of the principle of substitutability in defining occupations, while trying not to ignore such factors as work environment, licensing, and employee concepts of their work group. The structure of their *Standard Occupational Classification* (SOC) is some departure from the traditional status ranking, but the need for data comparability has obviously constrained the changes.

Divisions of the SOC

Executive, Administrative, and Managerial Occupations
Engineers and Architects
Natural Scientists and Mathematicians
Social Scientists, Social Worker, Clergy, and Lawyers
Teachers, Librarians, and Counselors
Independent Health Practitioners
Writers, Artists, Athletes, and Entertainers
Health Technicians and Technologists
Technicians and Technologists, Except Health
Sales Occupations
Clerical Occupations
Service Occupations
Agricultural and Related Occupations
Construction and Extractive Occupations
Transportation and Material Moving Occupations
Mechanics and Repairers
Precision Working Occupations
Production Working Occupations
Elemental Occupations
Military Occupations
Miscellaneous Occupations

The unique contribution here is the systematizing of the detailed specialties of the DOT into more broadly defined occupations (called "unit groups") which emphasize common content rather than distinctions of level. The consistency and care of those difficult detailed decisions promises a level of definitional detail that is more consistent with our data producing capabilities and most uses

for occupational information. The effort also reinforces the other principles noted in this paper—the emphasis on similarity of job content in a context that is broad enough to recognize the dynamics of the labor market and work force and to permit useful analysis of related variables.

Obviously both the functional and Scoville's assumptions and model need to be tested, as does the SOC. Complete systems must be built and detailed job data classified, but these three approaches to developing a general purpose classification of work show promise of transcending many of the limitations of present classification schemes.

DISCUSSION: IMPLICATIONS FOR EDUCATION

Any review of occupations reveals an impressive array of skills and work settings. Some have substantial manual components—the traditional realm of vocational education—but many require special intellectual and/or social skills. Certainly the type and combinations of skills differ among clusters, but even within clusters mobility seems to require skills in all three realms. Career-centered education cannot equip people for occupational transfers with exclusive focus on any one of those three types.

Many writers, reviewing the evidence on transfers, conclude that the only strategy is to prepare young people broadly, to impart a wide range of skills that are adaptable to differing occupations. There are several problems with a "jack of all trades" policy. Skill development is time consuming for both the individual and the institution, and both have many other things to do in addition to skill development. Moreover, skills deteriorate, especially those that have been learned but not practiced. Inasmuch as entry occupations with career potential require substantial investment in skill development and people apparently transfer more within than between career fields, the best policy seems to be to provide a focus at that level, to provide sufficient specific preparation for employment in an entry occupation with a future, and to supplement that specific training with various basic skills of the field.

The objection to this policy is that it is too focused, that in preparing in one area people forego other options, and that there is not enough information to make such a decision. The literature we have reviewed suggests we need not wait for all the data to come in. People are multitalented, occupations have flexible requirements, and the interaction is dynamic. Within reasonable limits it seems safe to say that any rigorous training has value.

There can be no doubt, however, that planning is an important prerequisite to an investment in training. The importance of the personal aspect of career choice and the multifaceted context within which work is done suggest two things for education besides skill training. First, developmental exercises and information must be provided so people can clarify their understanding of their own preferences and abilities and relate them to career opportunities. A second educational response, now largely lacking, is a broad look at work so that people have some awareness of not only the personal but also the economic and social dynamics and implication of work. This educational undertaking, not counseling or skill training but general social science education, would increase understanding and facilitate choice. With all the factors that influence transfers and as much as is known about them now, some such response seems crucial.

The need for an understanding of the content of jobs, their personal requirements, and the work setting seems especially intense among the young, but what of adults who change occupations? There are still numerous dynamic variables at play and they are even more poorly measured. Additionally the viable options at any particular time are often much narrower for them than for youths, dishearteningly narrow for many individuals. If what we know about career planning and the contexts of work were adequately conveyed to the young, such matters should require little updating for older job changers. Instead older workers could concentrate on new skills or ones that are newly relevant to them. Enough is known about occupational transfer patterns, not to mention learning, to know

that any pool of skills learned 10 to 30 years before will be inadequate for all necessary or desirable occupational transfers. Thus, an educational initiative to optimize transfers seems to need a component for adults.

Specific policy prescriptions must be modest, however, for they can be no more definitive than the underlying analysis of the situation or the clarity of the goals. It is clear from this paper that there are a multitude of potentially significant contributing factors to occupational transfers, factors that various analysts have identified as being common among occupations. Moreover, most appear potentially significant in explaining occupational transfers. But little is known about their relative importance for various people, let alone the influence that education can have. Any number of plausible educational policies could be formulated.

Thus, to reiterate a point made earlier, it seems unwise to leap from recognition of an occupationally related factor to curricular planning without the discipline of knowing something about the actual significance of the factor on transfers. Career education curricula must be designed around subjects that actually influence work histories.

We have isolated three types of information which a comprehensive education program could use. At a very general level is information pertinent to the phenomenon of work as a dominant social event in adult life. At a more specific level of detail is that information which attempts to match personal traits with various categories of work environments. And at the most specific level of detail is information which delineates the skill requirements of occupations. Since it is impossible for educators to teach everything which is relevant to work in America, information that pinpoints the key aspects at all levels of detail is important. This is aided by good classification systems—ones that synthesize the wide variety of data around a few key concepts, or classifying principles.

This places a premium on further information. As has been noted throughout this paper, occupational classification systems, by their very nature, yield more descriptive information than analytical conclusions. But they do identify potentially significant variables and provide a context for research on occupational transfers. Such empirical research will do much to identify the principal factors associated with transfers and consequently the relevant classification systems as well as to provide guidance to educational policy.

BIBLIOGRAPHY

Argyris, C. *Integrating the individual and the organization.* New York: Wiley and Sons, 1964.

Astin, H. S. Patterns of career choices over time. *Personnel and Guidance Journal,* February 1967, pp. 541-545.

Augustin, J. W., Cunningham, J. W., & Heath, W. D., III. *Affective correlates of systematically derived occupational variables: A reprinted study.* Raleigh: North Carolina State University at Raleigh, Center for Occupational Education, 1975.

Baker, C. O., & Wells, A. Q. *Associate degrees and other formal awards below the baccalaureate, 1971-1972.* Washington, DC: U. S. Government Printing Office, 1975.

Bennett, C. A. Toward empirical, practicable, comprehensive task taxonomy. *Human Factors,* 1971, *13* (3), 229-235.

Berg, I. *Education and jobs: The great training robbery.* Boston: Beacon Press, 1971.

Blaikie, N. W. H. Towards a theoretical model for the study of occupational choice. *Sociology,* 1971, *5* (3), 313-330.

Blau, P. M., & Duncan, O. D. *The American occupational structure.* New York: Wiley and Sons, 1967.

Boese, R. R., & Cunningham, J. W. *Systematically derived dimensions of human work* (Ergometric R&D Series Rep. No. 14). Raleigh: North Carolina State University at Raleigh, Center for Occupational Education, 1975.

Bottoms, G., & O'Kelley, L. Vocational education as a developmental process. *American Vocational Journal,* March 1971, pp. 21-24.

Byrne, J. J. Occupational mobility of workers. *Monthly Labor Review,* February 1975, pp. 53-59.

Caplow, T. *The sociology of work.* New York: McGraw-Hill, 1964.

Cassell, F. H., Doctors, S. I., & Director, S. M. *A three company study of the intrafirm mobility of blue collar and lower white collar workers.* Evanston, IL: Northwestern University, 1972.

Christal, R. E. USAF occupational research projects of tri-service interest. *Proceedings Tri-Service Conference on New Approaches to Personnel Systems Research* (DNR Symposium Report, ACR-76). Washington, DC: Office of Naval Research, 1962, pp. 62-75.

Christal, R. E., & Madden, J. M. *Air Force research on job evaluation procedures* (ASD-TN-61-46). Lackland Air Force Base, TX: Aeronautical Systems Division (AFSC), Personnel Laboratory, June 1961.

Christal, R. E., Madden, J. M., & Harding, F. D. *Reliability of job evaluation ratings as a function of number of raters and length of job descriptions* (WADD-TN-60-257). Lackland Air Force Base, TX: Wright Air Development Division (ARDC), Personnel Laboratory, October 1960.

Cotgrove, S., & Fuller, M. Occupational socialization and choice: The effects of sandwich courses. *Sociology*, 1972, *6* (1), 59-70.

Cunningham, J. W. *Ergometrics: A systematic approach to some educational problems* (Ergometric R&D Series Rep. No. 2). Raleigh: North Carolina State University at Raleigh, Center for Occupational Education, 1976.

Cunningham, J. W. (Ed.). *The job cluster and its curricular implications: A symposium.* Raleigh: North Carolina State University at Raleigh, Center for Occupational Education, 1969.

Cunningham, J. W., Slonaker, D. F., & Riegel, N. B. *The development of interest scales based on systematically derived work dimensions: A pilot study* (Ergometric R&D Series Rep. No. 15). Raleigh: North Carolina State University at Raleigh, Center for Occupational Education, 1975.

Cunningham, J. W., Tuttle, T. C., Floyd, J. R., & Bates, J. A. *Occupational analysis inventory.* Raleigh: North Carolina State University at Raleigh, Center for Occupational Education, 1971.

Dawis, R. V., & Lofquist, F. H. Personality style and the process of work adjustment. *Journal of Counseling Psychology*, 1976, *23* (1), 55-59.

Dawis, R. V., & Lofquist, F. H. Toward a psychological taxonomy of work. *Journal of Vocational Behavior*, 1975, *7*, 165-171.

Dawis, R. V., & Lofquist, F. H. Vocational needs, work reinforcers, and job satisfaction. *The Vocational Guidance Quarterly*, December 1975, pp. 132-139.

Denison, E. F. *Accounting for United States economic growth, 1929-1969.* Washington, DC: The Brookings Institution, 1974.

Doeringer, P. B., & Piore, M. J. *Internal labor markets and manpower analysis.* Lexington, MA: D. C. Heath & Co., 1971.

Downey, H. K., & Hellriegel, D. Organizational climate and job satisfaction. *Journal of Business Research*, 1974, *2* (3).

Downey, H. K., Hellriegel, D., & Slocum, J. W. Congruence between individual needs, organizational climate, job satisfaction and performance. *Academy of Management Journal*, 1975, *18* (1), 149.

Dull, L. W. The cluster concept in career education. *Educational Leadership*, December 1972, pp. 48-221.

Duncan, O. D., Featherman, D. L., & Duncan, B. *Socioeconomic background and achievement.* New York: Seminar Press, 1972.

Featherman, D. L. A research note: A social structural model for the socio-economic career. *American Journal of Sociology*, 1971, *77* (2), 293-304.

Fine, S. A. Functional job analysis. *Journal of Personnel Administration*, 1955, *2*, 1-16.

Fine, S. A., Holt, A. M., & Hutchinson, M. F. *Functional job analysis: How to standardize task statements* (Methods for Manpower Analysis, No. 9). Kalamazoo: The W. E. Upjohn Institute for Employment Research, 1974.

Fine, S. A., & Wiley, W. W. *An introduction to functional job analysis.* Kalamazoo: The W. E. Upjohn Institute for Employment Research, 1971. (ERIC Document Reproduction Service No. ED 060 221).

Flanagan, J. C., Tiedeman, D. V., Willis, M. B., & McLaughlin, D. H. *The career data book: Results from Project Talent's five-year follow-up study.* Palo Alto: American Institutes for Research, 1973.

Fleishman, E. A. Development of a behavior taxonomy for describing human tasks: A correlational-experimental approach. *Journal of Applied Psychology*, 1967, *51* (1), 1-9.

Fleishman, E. A. On the relation between abilities, learning, and human performance. *American Psychologist*, 1972, *27*, 1017-1032.

Ford, J., & Box, S. Sociological theory and occupational choice. *Sociological Review*, November 1967, pp. 287-299.

Frantz, N. R., Jr. *Career cluster concepts* (Information Series No. 78). Columbus: The Ohio State University, The Center for Vocational Education, 1973.

Gagné, R. M. (Ed.). *Psychological principles in system development.* Ann Arbor: Holt, Rinehart & Winston, 1962.

Gagné, R. M. *Task analysis and the establishment of human performance.* Philadelphia: American Psychological Association, 1963.

Gallaway, L. E. *Interindustry labor mobility in the United States 1957-1960.* Washington, DC: U.S. Government Printing Office, 1967.

Ghiselli, E. E. *The validity of occupational aptitude tests.* New York: Wiley and Sons, 1966.

Ginzberg, E. Toward a theory of occupational choice: A restatement. *Vocational Guidance Quarterly*, March 1972, pp. 169-175.

Gordon, J. B. Occupational classification: Current issues and an interim solution (Processed). New York: Columbia University, Bureau of Applied Social Research, n.d.

Gottfredson, G. D., & Holland, J. L. Vocational choice of men and women: A comparison of predictors from the Self-Directed Search. *Journal of Applied Psychology*, January 1975, pp. 28-33.

Greene, S. Some recent decennial census occupational experimental work. *Proceedings of the Social Statistics Section of the American Statistical Association*, 1966, pp. 196.

Gross, E. A sociological approach to the analysis of preparation for work life. *Personnel and Guidance Journal*, January 1967, pp. 416-423.

Haller, A. O., & Portes, A. Status attainment processes. *Sociology of Education*, Winter 1973, pp. 51-91.

Hansen, L. S. *Career guidance practices in school and community*. Washington, DC: National Vocational Guidance Association, 1970.

Hatt, P. K. Occupation and social stratification. *American Journal of Sociology*, 1950, *LV* (6), 533-543.

Heath, W. D., III, Cunningham, J. W., & Augustin, J. S. *Ability correlates of systematically derived occupational variables: A repeated study* (Ergometric R&D Series Rep. No. 13). Raleigh: North Carolina State University at Raleigh, Center for Occupational Education, 1973.

Hellriegel, D., & Slocum, J. W., Jr. Organizational climate: Measures, research, and contingencies. *Academy of Management Journal*, 1974, *17* (2).

Hemphill, J. K. *Dimensions of executive positions* (Research Monograph No. 89). Columbus: The Ohio State University, Bureau of Business Research, 1960.

Herzberg, F., Mausner, B., & Snyderman, B. B. *The motivation to work*. New York: Wiley and Sons, 1959.

Hodge, R. W., & Siegel, P. M. The classification of occupations: Some problems of sociological interpretation. *Proceedings of the Social Statistics Section of the American Statistical Association*, 1966, pp. 177-178.

Holland, J. L. *Making vocational choices: A theory of careers*. Englewood Cliffs, NJ: Prentice-Hall, 1973.

Holland, J. L. *The psychology of vocational choice: A theory of personality types and model environments*. Waltham, MA: Blaisdell Publishing Company, 1966.

Holland, J. L., Sorensen, A. B., Clark, J. P., Nafziger, D. H., & Blum, Z. D. Applying an occupational classification to a representative sample of work histories. *Journal of Applied Psychology*, 1973, *58* (1), 34-41.

Hollingshead, A. B., & Redlich, F. C. *Social class and mental illness*. New York: Wiley & Sons, 1958.

Hoppock, R. *Occupational information* (4th ed.). New York: McGraw-Hill, 1957.

International Labor Office. *International standard classification of occupations*. Geneva: Author, 1958, pp. 3.

International Labor Office. *International standard classification of occupations* (Rev. ed.). Geneva: Author, 1968.

Jaffe, A. J., & Carleton, R. O. *Occupational mobility in the United States 1930-1960*. New York: Columbia University, 1954.

Kapel, D. E. Career ladders and lattice: An opportunity for education or a dead end for urban schools? *Education and Urban Society*, August 1970, pp. 371-383.

Katz, M. R. Career decision making: A computer-based system of interactive guidance and information (SIGI). *Proceedings of the 1973 Invitational Conference on Testing Problems.* Princeton: Educational Testing Service, 1973.

Kohen, A. I. Occupational mobility among middle-aged men. *The Pre-Retirement Years, Vol. 4* (Manpower R&D Monograph 15). Columbus: The Ohio State University, Center for Human Resource Research, 1975.

Kroll, A. M., Dinklage, L. B., Lee, J., Marley, E. D., & Wilson, E. H. *Career development: Growth and crisis.* New York: Wiley and Sons, 1970.

Leider, R. J. Why a second career? *The Personnel Administrator.* March-April 1974, pp. 40-45.

Levine, J. M., Romashko, T., & Fleishman, E. A. Evaluation of an abilities classification system for integrating and generalizing human performance research findings: An application to vigilance tasks. *Journal of Applied Psychology*, 1973, *58* (2), 149-157.

Lewin, D., Horton, R., Shick, R., & Brecher, C. *The urban labor market.* New York: Praeger Publishers, 1974.

Lofquist, L. H., & Dawis, R. V. *Adjustment to work: A psychological view of man's problems in a work-oriented society.* New York: Appleton-Century-Crofts, 1969.

Lofquist, L. H., Dawis, R. V., & Weiss, D. J. *Counseling use of the Minnesota Importance Questionnaire.* Minneapolis: University of Minnesota, Vocational Psychology Research Work Adjustment Project, 1975.

Lydon, F. J., Shipman, G. A., & Kroll, M. (Eds.). *Policy decisions and organization.* New York: Appleton-Century-Crofts, 1969.

Maslow, A. H. *Motivation and personality.* New York: Harper and Brothers, 1954.

McCormick, E. J., Cunningham, J. W., & Gordon, G. C. Job dimensions based on factorial analysis of worker-oriented job variables. *Personnel Psychology*, 1967, *20*, 417-430.

McCormick, E. J., & DeNisi, A. S. An alternate approach to test validation. *The Personnel Administrator*, January 1967, pp. 57.

McCormick, E.J., Jeanneret, P. R., & Mecham, R.C. A study of job characteristics and job *dimensions as based on the Position Analysis Questionnaire.* Lafayette: Purdue University, Occupational Research Center, 1969.

McCormick, E. J., Jeanneret, P. R., & Mecham, R. C. A study of job characteristics and job dimensions as based on the Position Analysis Questionnaire. *Journal of Applied Psychology* (Monograph), 1972, *56* (4), 347-368.

McGregor, D. *The human side of enterprise.* New York: McGraw-Hill, 1960.

McKinlay, D. B. *A functional classification of occupations.* Eugene: University of Oregon, 1971.

McKinlay, B., & Johnson, L. E. *Forecasting occupational supply: A methodological handbook.* Eugene: Oregon Department of Employment, Manpower Research Project, February 1969.

McLaughlin, D. H., & Tiedeman, D. V. Eleven-year career stability and change as reflected in Project Talent data through the Flanagan, Holland, and Roe occupational classification systems. *Journal of Vocational Behavior,* 1974, *5,* 188.

Miller, R. B. Task taxonomy: Science of technology? *Ergonomics,* 1967, *10,* 167-176.

Mitchell, A. M., Jones, G. B., & Krumboltz, J. D. (Eds.). *A social learning theory of career decision making* (Report to the National Institute of Education). Palo Alto: American Institutes for Research, n.d.

Morris, R. T., & Murphy, R. J. The situs dimension in occupational structure. *American Sociological Review,* 1949, *24* (3) 231-239.

Morgan, T. The whys and wherefores of occupational classification. *Personnel Management,* April 1973, pp. 22-25.

Morrison, R. F., & Arnold, S. J. A suggested revision in the classification of non-professional occupations in Holland's theory. *Journal of Counseling Psychology,* 1974, *21* (6), 485-488.

Morsh, J. E. Job analysis in the United States Air Force. *Personnel Psychology,* 1964, *17,* 7-17.

Morsh, J. E., & Christal, R. E. *Impact of the computer on job analysis in the United States Air Force* (PRL-TR-66-19, AD 656 304). Lackland Air Force Base, TX: Aerospace Medical Division (AFSC), Personnel Research Laboratory, 1966.

Morsh, J. E., Giorgia, M. J., & Madden, J. M. *A job analysis of a complex utilization field—The R&D Management Officer.* Lackland Air Force Base, TX: Aerospace Medical Division (AFSC), Personnel Research Laboratory, 1965.

Mosel, J. N. *The domain of worker functions as a partially ordered set.* Philadelphia: American Psychological Association, 1963.

Musgrave, P. W. Towards a sociological theory of occupational choice. *Sociological Review,* March 1967, pp. 33-46.

Myers, J. K., & Bean, L. L. *A decade later: A follow-up of social class and mental illness.* New York: Wiley and Sons, 1968.

Nafziger, D. H., Holland, J. L., Helms, S. T., & McPartland, J. M. Applying an occupational classification to the work histories of young men and women. *Journal of Vocational Behavior,* 1974, *5,* 331-345.

National Manpower Council. *A policy for skilled manpower.* New York: Columbia University Press, 1954.

Office of Management and Budget. *Standard occupational classification manual* (Draft). Washington, DC: Author, 1975.

Osipow, S. H. *Theories of career development.* New York: Appleton-Century-Crofts, 1968.

Parnes, H. S., & Nestel, G. Middle-aged job changers. *The Pre-Retirement Years, Vol. 4* (Manpower R&D Monograph 15). Columbus: The Ohio State University, Center for Human Resource Research, 1975.

Parsons, G. E. *An application of John Holland's vocational theory for an empirical study of occupational mobility of men age 45-49.* Athens: Ohio University, 1971.

Parsons, G. E., & Wigtil, J. V. Occupational mobility as measured by Holland's theory of career selection. *Journal of Vocational Behavior,* 1974, *5,* 326-327.

Pass, J. J., & Cunningham, J. W. *Occupational clusters based on systematically derived work dimensions* (Ergometric R&D Series Rep. No. 16). Raleigh: North Carolina State University at Raleigh, Center for Occupational Education, 1976.

Pass, J. J., & Cunningham, J. W. *A systematic procedure for estimating the human attribute requirements of occupations* (Ergometric R&D Series Rep. No. 11). Raleigh: North Carolina State University at Raleigh, Center for Occupational Education, 1975.

Pratzner, F., & Hansen, M. *The relative effectiveness of two ways of structuring and presenting pre-service and initial in-service vocational industrial teacher education lessons.* Minneapolis: University of Minnesota, Minnesota Research Coordination Unit in Vocational Education, 1969.

Prien, E. P., & Ronan, W. W. Job analysis: A review of research findings. *Personnel Psychology,* 1971, *24,* 371-396.

Primoff, E. S. Empirical validations of the J-coefficient. *Personnel Psychology,* 1959, *12,* 413-418.

Primoff, E. S. The J-coefficient approach to jobs and tests. *Personnel Administration,* 1957, *20* (3), 34-40.

Quinn, R. P., & Shepard, L. J. *The 1972-1973 quality of employment survey* (Report to the Employment Standards Administration, U.S. Department of Labor). Ann Arbor: University of Michigan, Institute for Social Research, Survey Research Center, 1974.

Reiss, A. J., Jr. *Occupations and social status.* New York: The Free Press of Glencoes, 1961.

Robinson, J. P., Athanasiou, R., & Head, K. B. *Measures of occupational attitudes and occupational characteristics.* Ann Arbor: The University of Michigan, Institute for Social Research, 1969.

Roderick, R. D., & Kohen, A. I. *Years for decision: A longitudinal study of the educational and labor market experience of young women, Vol. 3.* Columbus: The Ohio State University, Center for Human Resource Research, 1973.

Roe, A. *The psychology of occupations.* New York: Wiley and Sons, 1956.

Roe, A., Hubbard, W. D., Hutchinson, T., & Bateman, T. Study of occupational history: Part 1, job changes and the classification of occupations. *Journal of Counseling Psychology*, 1966, *13* (4), 387.

Schneider, B. Organizational climate: Individual preferences and organizational realities. *Journal of Applied Psychology*, 1972, *56* (3), 211.

Schneider, B., & Bartlett, C. J. Individual differences and organizational climate 11: Measurement of organizational climate by the multi-trait, multi-rater matrix. *Personnel Psychology*, 1970, *23*, 493.

Scoville, J. G. The development and relevance of U.S. occupational data. *Industrial and Labor Relations Review*, 1965, *XIX*, (1), 70-79.

Scoville, J. G. *The job content of the U. S. economy 1940-1970.* New York: McGraw-Hill, 1969.

Scoville, J. G. Making occupational statistics more relevant. *Proceedings of the Business and Economic Statistics Section of the American Statistical Association*, 1965, pp. 317-323.

Scoville, J. G. *Manpower and occupational analysis: Concepts and measurements.* Lexington, MA: D. C. Heath and Co., 1972.

Sheppard, H. L. The emerging pattern of second careers. *Vocational Guidance Quarterly*, 1971, *20* (2), 89-95.

Sinick, D. (Ed.) *The vocational guidance quarterly*, 1975, *24* (2).

Slocum, W. *Occupational careers: A sociological perspective.* Chicago: Aldine Publishing Co., 1974.

Sorenson, A. B. *The occupational mobility process: An analysis of occupational careers.* Baltimore: Johns Hopkins University, Center for the Study of Social Organization of Schools, 1972.

Super, D. E. Vocational development theory: Persons, positions and processes. *Counseling Psychologist*, 1969, *1* (1), 2-9.

Super, D. E. *The psychology of careers: An introduction to vocational development.* New York: Harper & Row, 1957.

Super, D. E., & Bohn, J. *Occupational psychology.* Belmont, CA: Wadsworth Publishing Co., 1970.

Super, D. E., & Crites, J. O. *Appraising vocational fitness* (Rev. ed.). New York: Harper & Row, 1962 (Especially chapters VII-VIII).

Super, D. E., Starishevsky, N. M., & Jordaan, J.P. *Career development: Self concept theory.* Princeton, NJ: College Entrance Examination Board, 1963.

Taylor, J. E., Montague, E. K., & Michaels, E. R. *An occupational clustering system and curriculum implications for the comprehensive career education model.* Alexandria, VA: Human Resources Research Organization, 1972.

Temme, L. V. *Occupation: Meanings and measures.* Washington, DC: Bureau of Social Science Research, 1975.

Thal-Larsen, M., & Parrish, G. R. *Career guidance for science students: Systems, practices, and data base.* Washington, DC: National Science Foundation, Office of Experimental Projects and Programs, 1975.

Tinbergen, J. Employment forecasting and planning. *Employment Forecasting.* Paris: Organization for Economic Co-operation and Development, 1962, pp. 16.

Tyler, L. E. *The psychology of human differences* (3rd ed.). New York: Appleton-Century-Crofts, 1965.

U.S. Department of Labor, Bureau of Employment Security. *Dictionary of occupational titles,* Vol. I (3rd ed.). Washington, DC: U.S. Government Printing Office, 1962.

U.S. Department of Labor, Bureau of Employment Security. *Dictionary of occupatinal titles,* Vol. II (3rd ed.). Washington, DC: U.S. Government Printing Office, 1962.

U.S. Department of Labor. *Guide to the use of the general aptitude test battery.* Washington, DC: Bureau of Employment Security, 1962.

U.S. Department of Labor, Bureau of Labor Statistics. *Occupational outlook handbook* (1976-77 ed.). Washington, DC: U.S. Government Printing Office, 1976.

U.S. Department of Labor, Bureau of Labor Statistics. *Survey of professional, administrative, technical, and clerical pay.* Washington, DC: U.S. Government Printing Office, various years.

U.S. Department of Labor, Manpower Administration. *Handbook for analyzing jobs.* Washington, DC: U.S. Government Printing Office, 1972.

U.S. Department of Labor, Manpower Administration. *The pre-retirement years, Vol. 4* (Manpower R&D Monograph 15). Washington, DC: U.S. Government Printing Office, 1975.

U.S. Department of Health, Education, and Welfare; & U.S. Department of Labor. *Vocational education and occupations.* Washington, DC: U.S. Government Printing Office, July 1969.

U.S. Department of Health, Education, and Welfare; Office of Education. *Career Education.* Washington, DC: U.S. Government Printing Office, 1971.

U.S. Department of Health, Education, and Welfare; Office of Education. *Digest of educational statistics 1973 Edition.* Washington, DC: U.S. Government Printing Office, 1974.

U.S. Government Printing Office. *Manpower report to the President.* Washington, DC: Author, 1974.

Watley, D. J., & Werts, C. E. Career selection: Turnover analysis and the 'birds of a feather' theory. *Journal of Counseling Psychology,* 1969, *16* (3) 254-259.

Webster's new world dictionary of the American language (College ed.). New York: The New World Publishing Company, 1966, pp. 586.

Wilensky, H. L. Orderly career and social participation: The impact of work history on social integration in the middle class. *American Sociological Review*, 1961, *26*, 521-539.

Wirtz, W., & Goldstein, H. *A critical look at the measuring of work.* Washington, DC: The National Manpower Institute, 1975.

Wolfbein, S. L. (Ed.). *Labor market information for youths.* Philadelphia: Temple University, 1975.

Work in America: Report of a Special Task Force to the Secretary of HEW. Cambridge, MA: MIT Press, 1973.

Yavitz, B., Morse, D. W., & Dutka, A. B. *The labor market: An information system.* New York: Praeger Publishers, 1973.

PLANNED PROJECT REPORTS

The following is a list of approximate titles and estimated dates for currently planned project reports. The reader is cautioned that many of the reports are not yet available, and that both titles and dates of availability are tentative and can change in the future. Announcements of availability and information for ordering copies of reports will be published in future issues of The Center's monthly newsletter, *Centergram*.

Characteristics of Jobs Considered Common—Review of Literature and Research. Bruce McKinlay (available Winter 1977).

A review of various approaches for classifying or clustering jobs, and their use for describing the elements of commonality involved when people make career changes; intended for better understanding occupational adaptability and skill transfer.

Developing Transferable Skills: Review of Current Practices in Training and Selection Programs (available Fall 1977).

A review of selected training programs, with clues, suggestions, and recommendations for practice which appear to have been successful for recognizing skill transfer and taking advantage of student's prior skills and experience.

The Nature of Transferable Skills—Review of Literature and Research. Douglas Sjogren (available Summer 1977).

A review of what is known about the range of occupation-related skills and characteristics that could be considered transferable from one occupation to another. Expected to focus on describing those transferable skills which are teachable in secondary and post-secondary career preparation programs.

Occupational Classifications and Mobility Data: A Catalog of Classification Schemes and Data Bases (available Summer 1977).

Expected to be a quick and concise reference to the content of numerous existing occupational data bases and job classification schemes. Abstracts of each data base and classification scheme will include such information as: identification, investigator, location, documentation, access, design information, subject variables, occupation variables, and organizational variables.

Report of Employer's Reactions to the Notion of Transferable Skills (available Spring 1977).

A report of the views expressed in nine meetings across the country by groups of local community and business representatives concerning the types of transferable skills required and useful in their work settings and how a better understanding of transferable skills could improve training and occupational adaptability.

A Study of Occupationally-Transferable Skills: Final Project Summary Report (available Fall 1977).

An executive summary final report of the project, expected to summarize recommendations for subsequent research and development growing out of each project activity and report.

Transferability of Vocational Skills—Review of Literature and Research. James Altman (available Winter 1977).

A review of what is known about the transferability of occupational skills. Expected to focus on describing the process or the facilitators of skill transfer.

INFORMATION CURRENT AS OF DECEMBER 1976